POPULAR SCIENCE

SEPTEMBER · 35¢

Big Annual Home-Improvement Section

HOW TO GET MORE LIVING SPACE

First 1958 car—

All About Ford's Luxury-Loaded Edsel

MAKES EVERY KIND OF CUT

Weller SABRE SAW *portable jig saw*

Here's 7 saws in 1 in a handsome, streamlined polished aluminum housing. Truly portable, use it anywhere . . . never needs lubrication.

The Weller Sabre Saw offers power and performance found only in saws costing much more. And it has many exclusive features; such as its strain-relief design that eliminates blade breakage.

Smooth, steady cutting is provided by reciprocating motor . . . no gears to wear or parts to replace. Supplied with 3 special blades for fine work, rough cutting and metal, and blade adjustment wrench. Guaranteed for one year.

Weller

Other Weller tools include popular SOLDERING KIT $7.95 and POWER SANDER $14.95. On display at your Dealer.

ELECTRIC CORP., Easton, Pa.

This Practical Self-Study Course will give you

A COMPLETE MASTERY OF MATHEMATICS EASILY, QUICKLY

5 VOLUMES
3,500 Pages
Illustrated

Learn Mathematics... get a BETTER JOB!

Now you, too, can learn mathematics and get the basic training for a better job... the kind of training that is quickly recognized today and gladly paid for.

Just look at the "help wanted" ads in any big-time newspaper—look at the hundreds of wonderful opportunities for men who know mathematics: superintendents and foremen, technicians and laboratory workers, designers, draftsmen, mathematicians and engineers. Look at the huge companies—page after page of them—that are advertising for help *every day in the year!* They all need trained men, men who know mathematics, to help them keep up with the ever-increasing demands in aviation, electronics, nuclear science, automation, jets and missiles.

Now you can learn mathematics—the foundation of all technical work—quickly, easily, inexpensively and right in your own home. A very simple and interesting course in book form has been prepared for you by an expert who has devoted a lifetime to teaching practical men the fundamentals of this important subject. Every minute you spend on this complete, practical course in mathematics will pay you big dividends.

MATHEMATICS For Self Study

By J. E. Thompson, B.S. in E.E., A.M., Dept. of Mathematics, Pratt Institute

A COMPLETE COURSE AND REFERENCE LIBRARY

You start right from the beginning with a review of arithmetic that gives the special short cuts and trick problems that save countless hours of time. Then, step by step, you go into higher mathematics and learn how simple it all can be when an expert explains it to you.

Get This Training in Only Ten Minutes a Day

You can gain all the benefits of a mathematical training in just a few months if you will devote only ten minutes each day to these easy, practical lessons.

An Expert Gives You His Simplified Methods

Prof. Thompson, the author of these books, is an expert at teaching *practical* Mathematics. He presents each problem in the clearest, simplest way. He gives you the kind of information you need for *success!*

Here are but a few of the hundreds of subjects simplified and explained in this complete self-study course in mathematics:

ARITHMETIC: Starting with a quick review of principles, this book gives you the special calculation methods used in business and industry that every practical man should know. Above all else it shows you how to attain speed and accuracy with fractions and decimals, ratio and proportion, etc. Fundamentals in all computations in engineering—in both plant and field—and the essential methods for rapid calculation are made clear and simple.

ALGEBRA: This volume makes algebra a live interesting subject. The author starts with simple problems that can be solved by arithmetic and then shows you how to apply algebraic methods. Among other subjects, it teaches you all about logarithms—the method of computation that engineers use to save time. It also shows you how to solve problems which are involved in business and industrial work relating to machines, engines, ships, autos, planes, etc.

GEOMETRY: This book gives you the practical, common-sense method for solving all problems in both plane and solid geometry—problems ranging from the simplest distance problems to the geometry of spheres which have applications ranging all the way from the atom to the earth itself.

TRIGONOMETRY: Practically every problem in machine work, land surveying, mechanics, astronomy and navigation is solved by methods of trigonometry, and this interesting volume makes the methods of solving them clear and easy. These methods are explained simply with actual examples of calculations of height and distance as applied to meteorology, the position of a ship at sea, the construction of buildings, bridges and dams, the cutting of gears, etc.

CALCULUS: This branch of mathematics deals with rate problems and is essential in computation involving objects moving with varying rates of speed. It also enables you to find the most efficient design for any kind of mechanism, engine, or moving vehicle.

D. VAN NOSTRAND COMPANY, INC., PUBLISHERS, PRINCETON, NEW JERSEY

Thousands of Jobs Are Waiting for Trained Men

INDUSTRY is working at top capacity to meet the needs of our gigantic industrial program. Trained mechanics and technicians are in urgent demand, and in practically ALL OF THESE JOBS a knowledge of mathematics is required.

Remember, mathematics is the foundation of all technical work. Give yourself this basic preparation now by this quick, convenient, inexpensive method.

SEND NO MONEY

Send no money now, not a penny! The coupon at right will bring you the complete course in book form for 10 days free trial. Unless you are convinced that this course is exactly what you need and want you may return the books and owe nothing; or you may keep them by sending us the small down payment of $1.85, balance in four monthly payments of $2.00 each. Take advantage of this opportunity. Mail the coupon NOW!

MAIL THIS COUPON

D. Van Nostrand Company, Inc. PS-9-57
120 Alexander Street, Princeton, New Jersey

Send me MATHEMATICS FOR SELF STUDY in 5 volumes. Within 10 days I will either return the books or send you $1.85 as first payment and $2.00 per month for four months until the total price of $9.85, plus a few cents' postage, is paid.

(If you send $9.85 with this coupon, we will pay the postage. Same return privilege, refund guaranteed.)

Name_____

Address_____

City_____ Zone____ State_____

In Canada: Order from D. Van Nostrand Company Ltd. 25 Hollinger Road, Toronto, Canada

Founded in 1872 Vol. 171: No. 3 *Mechanics and Handicraft* REG. U. S. PAT. OFF.

Popular Science Monthly

September, 1957
Cover photograph by W. W. Morris

First time over the road, it travels piggyback atop this "haulaway"

Can new U.S. weapons protect our coasts from A-bomb-loaded subs? Here are the bone-chilling facts

AUTOMOBILE NEWS

All About the Luxury-Loaded Edsel · 98
Your New Car's First Trip · 128
Free-Pistons: "Engine of Tomorrow" · 138
How to Take Care of an Edsel · 242
Buying Good Retreads · 252

WORLD OF SCIENCE AND INDUSTRY

How Disaster Strikes · 104
Riding the Turnpike Express · 109
"Moonwatchers" Get Set for Satellite · 134
Are We Safe Against Russian Subs? · 161

SPECIAL FEATURES

Your Child Can Earn and Learn · 114
Million-Dollar Drive-In · 118
Toughest Rescue in Mining History · 124
Gus Referees a Bull Fight · 234
Why Buy a Tape Recorder? · 262

THE NEWS IN PICTURES

Missile Gets a Supersonic Boost · 142
Air Hammer Wears a Muffler · 148
Architect's House Uses No Wood · 151
Periscope Watches Nuclear Engine · 152

Managing Editor
HOWARD ALLAWAY

Associate Managing Editor
Frank Rowsome Jr.

Assistant Managing Editors
Kendall W. Goodwyn
Robert P. Stevenson

Senior Editors
Devon Francis
Martin Mann
Everett H. Ortner
Harry Walton

West Coast Editor
Wesley S. Griswold

Associate Editors
Erik H. Arctander
Alden P. Armagnac
Henry B. Comstock
Frank Dorr
Sheldon M. Gallager
Herbert O. Johansen
Herbert R. Pfister
Maryann Smith
Ruth Westphal
Richard A. Yahraes

Technical Editor
Hubert Luckett

Editorial Assistants
Rosa Lee Beeland (Chief)
Annette Krauss (Research)
Anna Dallas, Bebe Lipson,
Roberta Marks, Georgette Sparks

Art Director
HOWARD C. JENSEN

Art Editors
Herbert Anthony
Reginald A. Hawley
Harry Samuels

Art Associates
Al Heighington
Eric A. Karminski Jr.
Henry W. Kazmirowski
Adolph J. Le Moult
Richard J. Meyer
Dana B. Rasmussen

Photography
W. W. Morris (Chief)
Robert D. Borst
Orlando Guerra

America's Leading New-Idea Magazine for 85 Years

ANNUAL HOME-IMPROVEMENT SECTION

How to Buy Loans, Labor, Lumber · 168
6 Ways to Add Living Space · 170
You Can Live in the Basement Now · 172

Expand an Attic by Raising the Roof · 178
Move into Your Garage? · 181
Facts About Building an Addition · 188

6 Locations for That Extra Bath · 198
How to Move a Porch Indoors · 202
Dividers Lick Your Space Problem · 206
Home Tips from House Trailers · 209

4 Space-Making Ideas for Your Home · 212
Building Removable Steps · 214

Roof to cellar: PS tells how to get more living space out of your home

FOR HOME AND SHOP

Folding Rule Is 7 Bonus Tools · 218
PS Fix-It File: Plumbing Drains · 228
Short Cuts and Tips · 277

WHAT'S NEW IN . . .

Keeping the Home Shipshape · 10
Ideas from the Inventors · 158
Handyman Products · 224
Tools for Your Shop · 232
Hints from the Model Garage · 240
Car Accessories · 260

EVERY MONTH . . .

PS Readers Talk Back · 4
Prize Projects by PS Readers · 12
I'd Like to See Them Make · 14
You Ought to Know · 17
Wordless Workshop · 222
PS Shop Notebook · 273

Publisher
RALPH H. FLYNN

Advertising Manager
LEE P. ADAMS

Circulation Director
EUGENE WATSON

EDITORIAL OFFICES:
353 Fourth Ave., New York 10, N.Y.

ADVERTISING OFFICES:
NEW YORK—353 Fourth Ave.
CHICAGO—360 North Michigan Ave.
DETROIT—820 Book Bldg.
SAN FRANCISCO—114 Sansome St.
CLEVELAND—636 B. F. Keith Bldg.
LOS ANGELES—1127 Wilshire Blvd.
PORTLAND, ORE.—520 S.W. Sixth Ave.

SUBSCRIPTION SERVICE:
Address all subscriptions and correspondence concerning them to: Subscription Department, 353 Fourth Ave., New York 10, N. Y. Allow four weeks' notice for change of address. Please give both old and new addresses, including zone numbers.

Published monthly at 353 Fourth Avenue, New York 10, N. Y., by Popular Science Publishing Co., Inc., Godfrey Hammond, Chairman of the Board; Ralph H. Flynn, President and Treasurer; Franklin E. Parker Jr., Secretary; Eugene Watson, Vice-President. Second-class mail privileges authorized at New York, N. Y., and Dayton, Ohio. Entered as second-class matter at the Post Office Department, Canada. Printed in U.S.A.

Copyright, 1957, by Popular Science Publishing Co., Inc. All rights reserved in the United States, Great Britain, and in all the countries participating in the International Copyright Convention and Pan-American Copyright Convention.

Single copy 35¢. Subscriptions to United States, its possessions, and Canada, 1 year $3.40 (2 years $6.00, 3 years $8.00). Elsewhere, 1 year $6.00 (2 years $11.00, 3 years $16.00).

PS Readers

TALK BACK

In Defense of "Deadliest" Bomber

In reference to Mr. Heason's letter of complaint [June] about glamorizing bombers, I should like to point to a few things he has left out. As concerns the B-52 being a "deadliest bomber," it must also be remembered that it is our best insurance policy for peace. It also has glamor as one of the greatest engineering masterpieces of all times.

I believe Mr. Heason sleeps sounder at night knowing that there are B-52s stationed in England ready to protect him.

Peter D. Veillette,
West Hartford, Conn.

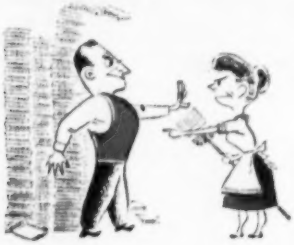
He Likes Picture News

I'd like to compliment you on the improvements in Popular Science, such as Picture News. It's better than having to scramble through the whole magazine searching for one thing or another.

Michael Smith, LaGrange, Ill.

No, Sir, You're Not Crazy

Mr. Phil McCafferty of Cedar Rapids, Iowa, says he has a pile 6′, 5″ high of Popular Science magazines which date back to Nov., 1930. I have him beat by about 13 years. My pile dates back to



July, 1917. My wife says I'm crazy for saving anything that long.

Francis F. Rosen, Faribault, Minn.

DKW Outperforms the SAAB

I have just finished your article, "What You Get in the Foreign Economy Cars," [June] and though I thought it a good article, I feel that a more appropriate two-cycle-engine car to test than the SAAB would be the German DKW . . . It has a top speed closer to 85 m. p. h. than the 75 your specification list says. It is a full five-passenger and, in the sedan, six-passenger. It is very much less austere than the SAAB. It is unexcelled in handling and has excellent performance (0-60 about 20 seconds).

Michael J. Stong, Falls Church, Va.

Foreign-Car Figures

Reading PS with the usual close attention, I seem to find two contradictions in

the tabular data (on the little foreign cars), pages 64 and 65 of the June issue. The very nice Borgward Isabella engine is given a displacement of 14.9 cubic inches. This seems improbable, especially for a 60 hp. rating. The Citroen 2CV is credited with the ability to accelerate from zero to 50 m. p. h. in 13½ seconds. My guess is that the figure should be 23½.

Robert Kruse, Madison, Conn.

Right as rain on both counts. The Borgward displaces about 91 cubic inches. The Citroen's acceleration should have read 23 seconds.

Puzzled Puzzlers

In your article, "Success Without a College Degree" [June], I disagree with the answer to question No. 1 of your sample mechanical-aptitude test. However, the drawings are not accurate enough to be sure. It appears that E makes an octagon instead of B.

Max A. Chapman, Dearborn, Mich.

. . . I discovered a mistake: Question

Then see your

DOCTOR OF MOTORS

If the years and the miles have taken the power and punch out of your engine's horsepower—your Doctor of Motors knows how to make your engine feel *all* there—alert, responsive and fun to command!

Skilled mechanics everywhere restore that New Car Feel by installing Perfect Circle 2-in-1 Chrome piston rings. Here's why: Perfect Circles are plated with thick, solid chrome that resists wear—more than doubles the life of cylinders, pistons and rings, and assures thousands of extra miles of driving pleasure and satisfaction.

For long life and responsive power with positive oil control, ask your mechanic to install Perfect Circle 2-in-1 Chrome piston rings in your engine. Perfect Circle Corporation, Hagerstown, Indiana; The Perfect Circle Co., Ltd., 888 Don Mills Road, Don Mills, Ontario, Canada.

PERFECT CIRCLE

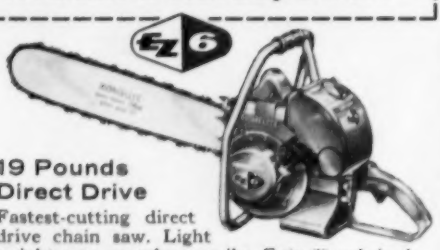
2-IN-1 CHROME PISTON RINGS *restore that New Car Feel*

You'll be surprised how quickly and economically your dependable Doctor of Motors can bring back a New Car Feel to your car.

See Them Now!

2 NEW HOMELITE Chain Saws

... both 6 Horsepower!



19 Pounds
Direct Drive

Fastest-cutting direct drive chain saw. Light weight goes anywhere easily. Cuts 8" oak in 4 seconds, 18" pine in 14 seconds. Perfect for cutting firewood, clearing campsites, building shelters.

22 Pounds
Gear Drive

Here's the real professional's saw . . . the new 6-22. Plenty of power to bring down trees up to 7 feet in diameter, fells 20" trees in 18 seconds. Perfectly balanced for easy handling. Makes any type of cut in any position . . . fells, bucks, limbs, notches, trims.

LAST CHANCE TO WIN!
CONTEST CLOSES SEPT. 30!

You may have three chances to win! Grand Prize: a free Homelite chain saw every year for life, PLUS 25 chain saws being given away by Homelite District Offices, PLUS hundreds of chain saws awarded by Homelite dealers in their own local contests. Nothing to buy, nothing to write, no obligation! See your Homelite Dealer today! Contest limited to residents of the United States and subject to local, state, county and city laws.

Find Your Homelite Dealer in the "Yellow Pages"

HOMELITE
A DIVISION OF TEXTRON INC
9209 RIVERDALE AVE., PORT CHESTER, N. Y.
Homelite builds and sells more chain saws than any other company in the world.
In Canada: Terry Machinery, Ltd.

No. 1 on your mechanical talent test has two answers, B and E.

JEROME BLOTCKY, Des Moines, Iowa

. . . Any mechanic can plainly see the answer is E, not B.

M. M. MOORE, Moonachie, N. J.

. . . It looks to me as if E is just as good a fit as B to make up the figure.

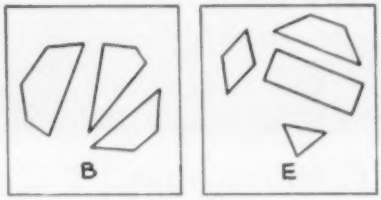
JOE MANN, Roslyn, Pa.

. . . No doubt many other readers were as surprised as I to learn that the unequal-sided pieces in B of the first examination question on your aptitude test would fit together to make the octagon. E is the obvious correct answer—cut out the pieces and try it.

That someone erred is perhaps not important, but it does seem that in extending the do-it-yourself craze to self-tests on everything from sex to psychology, we are often prone to take the word of self-styled experts in a series of "yes or no" and "true or false" tests which are perhaps easier to grade and classify but which will do nothing towards real education.

Thanks for an interesting series on education and jobs.

LOUIS EISEN, Phoenix, Arizona.



Our drawings were reduced from the size used in the actual tests, and the outlines softened by the color process, so that it is practically impossible for anyone to decide on the right answer for No. 1. But (cross our heart) ONLY the parts in B will form that octagon.

TV Is a Hog on the VHF Band

IN STATING that UHF channels are being given to VHF television stations as a means of equalizing the competition ["You Ought to Know," June], you bypass a major aim of current proposals to eliminate VHF television. There is a severe shortage of channels now, and this will worsen as more radio communication is needed. VHF television now occupies

Can you profit by their mistakes?

"Not getting enough education"

You needn't make that mistake. You can get that better job, those big promotions, the regular raises that so many I. C. S. students report. And you can do it without "going to school," without interfering with your present job or your social life.

YOU can study with I. C. S. at home, in your spare time!

"Wrong choice of career"

When you study with I. C. S. you have 257 courses to choose from. And part of our job here at I. C. S. is not only giving you instruction but making sure you pick the course that's right for you!

YOU get expert guidance FREE from I. C. S.!

"Failed to seize opportunities"

Your opportunity is right here on this page. Don't pass it by. Don't put it off. Mail the coupon now and let us send you our 3-book career kit.

YOU get 3 FREE books if you mail the coupon today!

1. **36-page gold mine of information, "How to Succeed."**
2. **Career Catalog outlining opportunities in your field.**
3. **Sample I. C. S. lesson (Math.).**

For Real Job Security—Get an I. C. S. Diploma! **I. C. S., Scranton 9, Penna.**

Member, National Home Study Council

INTERNATIONAL CORRESPONDENCE SCHOOLS

ICS

BOX 70968J, SCRANTON 9, PENNA. (Partial list of 257 courses)

Without cost or obligation, send me "HOW to SUCCEED" and the opportunity booklet about the field BEFORE which I have marked X (plus sample lesson):

ARCHITECTURE and BUILDING CONSTRUCTION
- ☐ Air Conditioning
- ☐ Architecture
- ☐ Arch. Drawing and Designing
- ☐ Building Contractor
- ☐ Building Estimator
- ☐ Carpentry and Millwork
- ☐ Carpenter Foreman
- ☐ Heating
- ☐ Interior Decoration
- ☐ Painting Contractor
- ☐ Plumbing
- ☐ Reading Arch. Blueprints

ART
- ☐ Commercial Art
- ☐ Magazine & Book Illus.
- ☐ Show Card and Sign Lettering
- ☐ Sketching and Painting

AUTOMOTIVE
- ☐ Automobiles
- ☐ Auto Body Rebuilding and Refinishing
- ☐ Auto Engine Tuneup
- ☐ Auto Technician

AVIATION
- ☐ Aero-Engineering Technology
- ☐ Aircraft & Engine Mechanic

BUSINESS
- ☐ Accounting
- ☐ Advertising
- ☐ Business Administration
- ☐ Business Management
- ☐ Cost Accounting
- ☐ Creative Salesmanship
- ☐ Managing a Small Business
- ☐ Professional Secretary
- ☐ Public Accounting
- ☐ Purchasing Agent
- ☐ Salesmanship
- ☐ Salesmanship and Management
- ☐ Traffic Management

CHEMICAL
- ☐ Analytical Chemistry
- ☐ Chemical Engineering
- ☐ Chem. Lab. Technician
- ☐ Elements of Nuclear Energy
- ☐ General Chemistry
- ☐ Natural Gas Prod. and Trans.
- ☐ Petroleum Prod. and Engr.
- ☐ Professional Engineer (Chem)
- ☐ Pulp and Paper Making

CIVIL ENGINEERING
- ☐ Civil Engineering
- ☐ Construction Engineering
- ☐ Highway Engineering
- ☐ Professional Engineer (Civil)
- ☐ Reading Struc. Blueprints
- ☐ Structural Engineering
- ☐ Surveying and Mapping

DRAFTING
- ☐ Aircraft Drafting
- ☐ Architectural Drafting
- ☐ Drafting Machine Design
- ☐ Electrical Drafting
- ☐ Mechanical Drafting
- ☐ Sheet Metal Drafting
- ☐ Structural Drafting

ELECTRICAL
- ☐ Electrical Engineering
- ☐ Elec. Engr. Technician
- ☐ Elec. Light and Power
- ☐ Practical Electrician
- ☐ Practical Lineman
- ☐ Professional Engineer (Elec)

HIGH SCHOOL
- ☐ High School Diploma
- ☐ Good English
- ☐ High School Mathematics
- ☐ Short Story Writing

LEADERSHIP
- ☐ Industrial Foremanship
- ☐ Industrial Supervision
- ☐ Personnel-Labor Relations
- ☐ Supervision

MECHANICAL and SHOP
- ☐ Diesel Engines
- ☐ Gas-Elec. Welding
- ☐ Industrial Engineering
- ☐ Industrial Instrumentation
- ☐ Industrial Metallurgy
- ☐ Industrial Safety
- ☐ Machine Design
- ☐ Machine Shop Practice
- ☐ Mechanical Engineering
- ☐ Professional Engineer (Mech)
- ☐ Quality Control
- ☐ Reading Shop Blueprints
- ☐ Refrigeration and Air Conditioning
- ☐ Tool Design ☐ Tool Making

RADIO, TELEVISION
- ☐ General Electronics Tech.
- ☐ Industrial Electronics
- ☐ Practical Radio-TV Eng'r'g
- ☐ Practical Telephony
- ☐ Radio-TV Servicing

RAILROAD
- ☐ Car Inspector and Air Brake
- ☐ Diesel Electrician
- ☐ Diesel Engr. and Fireman
- ☐ Diesel Locomotive

STEAM and DIESEL POWER
- ☐ Combustion Engineering
- ☐ Power Plant Engineer
- ☐ Stationary Diesel Engr.
- ☐ Stationary Fireman

TEXTILE
- ☐ Carding and Spinning
- ☐ Cotton Manufacture
- ☐ Cotton Warping and Weaving
- ☐ Loom Fixing Technician
- ☐ Textile Designing
- ☐ Textile Finishing & Dyeing
- ☐ Throwing
- ☐ Warping and Weaving
- ☐ Worsted Manufacturing

Name _____ Age _____ Home Address _____

City _____ Zone _____ State _____ Working Hours _____ A.M. to P.M. _____

Occupation _____

Canadian residents send coupon to International Correspondence Schools, Canadian, Ltd., Montreal, Canada. . . . Special tuition rates to members of the U. S. Armed Forces.

some 72 megacycles of a band suitable for mobile radio and other services that are not feasible in the UHF region.

Television could be restricted to UHF, thereby freeing the lower band for scatter propagation, mobile radio, telemetering and other services. As an example of the capacity used by TV, a single TV channel takes up as much frequency band as 200 voice channels. As for Joe Doakes needing an adapter for his set—that's the price of progress.

WILLIAM D. HIBBARD JR., Silver Spring, Md.

Wall-Covering Short Cut Sought

I AM looking for some material that would stick to old walls either as a bonding or finish coat—a material that would have a plaster type of finish and yet bond firmly to the old walls without any type of lath support.

RICHARD L. ZERNES, Newport News, Va.

If a smooth finish is not necessary, you could use a heavy textured paint. Rolled or troweled on, it gives a textured or stucco appearance. We have also heard of builders who use joint cement, but here again the finish is not smooth.

Thanks for Library Booklets

I'M VERY glad to see your new addition, the Popular Science Reference Library. I know that everyone who receives these splendid booklets will want to keep them for future use where time and money are factors. Thank you for starting this series.

FRED E. SAGER, Bethel, Kansas

The next booklet, on home TV repairs, will appear in the October issue.

Swing-Sway License Plate Illegal

AN ARTICLE and picture [from a California contributor, June, page 200] shows how to mount a license plate so it will "swing free when the trailer rides through tall weeds or roadside gullies." The traffic code here in California, Sec. 158, part B, states: "Every license plate shall at all times be securely fastened to the vehicle for which it is issued so as to prevent the plate from swinging . . ."

J. C. BRANSTETTER, San Francisco

New greaseless way to keep your hair neat all day...and prevent dryness

New Vitalis keeps hair in place and prevents dryness with V-7, the *greaseless* grooming discovery. You never have an over-slick, plastered-down look. Try it. You'll like it.

New VITALIS® Hair Tonic with V-7®

ANOTHER FINE PRODUCT OF BRISTOL-MYERS

IF you're that person, here's something that will interest you.

Not a magic formula—not a get-rich-quick scheme—but something more substantial, more practical.

Of course, you need something more than just the desire to be an accountant. You've got to pay the price—be willing to study earnestly, thoroughly.

Still, wouldn't it be worth your while to sacrifice some of your leisure in favor of interesting home study—over a comparatively brief period? Always provided that the rewards were good—a salary of $5,000 to $10,000 and up?

An accountant's duties are interesting, varied and of real worth to his employers. He has *standing!*

Do you feel that such things aren't for you? Well, don't be too sure. Very possibly they *can* be!

Why not, like so many before you, investigate LaSalle's modern Problem Method of training for an Accounting position?

Just suppose you were permitted to work in an accounting firm under the personal supervision of an expert accountant. Suppose, with his aid, you studied accounting principles and solved problems day by day—easy ones at first—then more difficult ones. If you could do this—and could turn to him for advice as the problems became complex — soon you'd master them all.

That's the training you follow in principle under the LaSalle Problem Method.

Over 4,500 Certified Public Accountants among LaSalle alumni

You cover accounting from Basic Accounting right through Principles and Basic Cost Accounting. As you go along, you absorb the principles of Accounting Systems and Federal Income Tax. Then you may choose Office Management, Governmental Accounting, Commercial Accounting, Industrial Accounting, or Public Accounting and prepare for the CPA examinations.

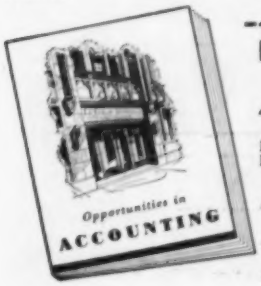
Your progress is as speedy as you care to make it—depending on your own eagerness to learn and the time you spend in study.

Will recognition come? The only answer, as you know, is that success *does* come to the man who is really *trained*. It's possible your employers will notice your improvement in a very few weeks or months. Indeed, many LaSalle graduates have paid for their training—with increased earnings—before they have completed it! For accountants, who are trained in organization and management, are the executives of the future.

Get Free Sample Lesson—Also "Opportunities in Accounting"

For your own good get all the facts about this completely new and modern accounting training. Write for Free Sample Lesson—also latest book "Opportunities in Accounting." They will prove that Accounting offers brilliant futures to those who aren't afraid of serious home study, and will show the wide range of opportunities that exist today. No cost or obligation. If you want a position of higher income, greater prestige and professional standing . . . MAIL THE COUPON NOW!

Accredited Member, National Home Study Council



LASALLE EXTENSION UNIVERSITY

A CORRESPONDENCE INSTITUTION

417 S. Dearborn St. Dept. 983H Chicago 5, Ill.

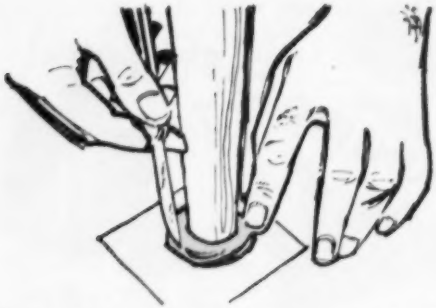
I want to be an accountant. Send me without obligation, Free Sample Lesson—also "Opportunities in Accounting."

Name.....*Age*.....

Address.....

City, Zone & State.....

Keeping the Home Shipshape

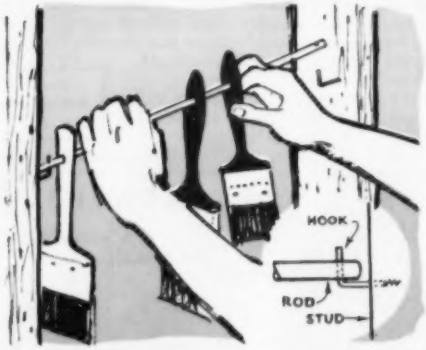


TO LEVEL WOBBLY FURNITURE, put a gob of wood putty on waxed paper, stand the short leg on it and press until even with the others. Trim off the excess putty and sand smooth.

MEASURING SPOONS REACH DEEP if you lengthen them with tubing. Partly flatten ⅜" aluminum tubing, cut the spoon handle to fit and clamp the tube tightly around it in a vise.

CONVERT A BUNK BED—or build a new one without the lower berth—to save space in a small one-child room. Fit the lower part with doors and shelves for storage closets.

PAINTING RADIATORS THIS FALL? For a faster, easier job, try one of the aerosol spray-on paints. Slip sheets of newspaper down behind the radiator to protect the wall.



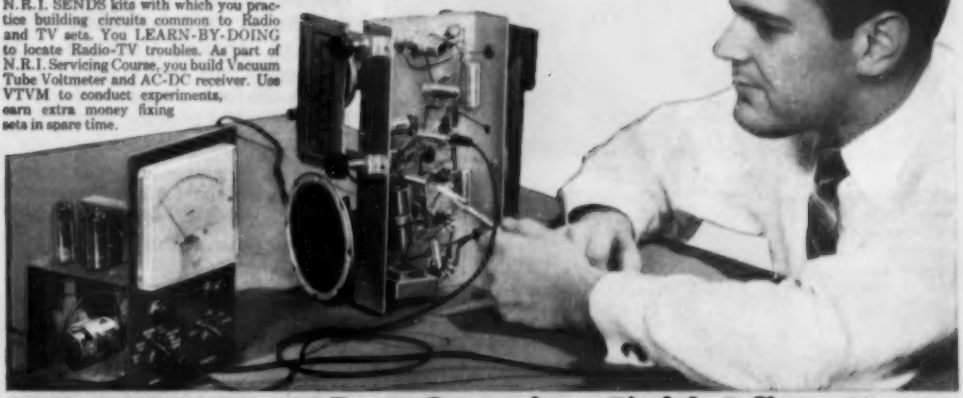
STORE PAINTBRUSHES on a round curtain rod mounted between studs in the garage. Saw off the ball ends so that the rod can be threaded through holes in the handles of the brushes.

Learn Radio-Television

Servicing or Communications

by Practicing at Home in Spare Time

N.R.I. SENDS kits with which you practice building circuits common to Radio and TV sets. You LEARN-BY-DOING to locate Radio-TV troubles. As part of N.R.I. Servicing Course, you build Vacuum Tube Voltmeter and AC-DC receiver. Use VTVM to conduct experiments, earn extra money fixing sets in spare time.



RADIO-TV BROADCASTING (see above) offers important positions as Operators and Technicians. RADIO-TV SERVICING Technicians (see below) needed in every community. Their services are respected, their skill appreciated.

Fast Growing Field Offers You Good Pay, Success, Bright Future

J. E. SMITH
Founder

Bigger than ever and still growing fast. That's why Radio-TV has special appeal to ambitious men not satisfied with their job and earnings. More than 4,000 Radio and TV stations. More than 150 million home and auto Radios, 40 million TV sets. Color TV promises added opportunities. For the trained man, there are good jobs, bright futures in Radio-TV Servicing or Broadcasting.

Training PLUS opportunity is the *ideal combination* for success. So plan *now* to get into Radio-TV. The technical man is looked up to. He does important work, gets good pay for it. Radio-Television offers that kind of work. NRI can supply training quickly, without expense of going away to school. Keep your job while training. You learn at home in your spare time. NRI is the OLDEST and LARGEST home study Radio-TV school. Its methods have proved successful for more than 40 years.

Added Income Soon - $10, $15 a Week in Spare Time

Soon after enrolling, many NRI students start to earn $10, $15 a week in spare time fixing sets. Some pay for their training and enjoy extra luxuries this way. Some make enough to start their own Radio-TV shops. NRI training is *practical*—gets quick results. Easy to understand, well illustrated lessons teach you basic principles. And you LEARN-BY-DOING by practicing with kits of equipment which "bring to life" things you study.

Find Out What NRI Offers

NRI has trained thousands for successful careers in Radio-TV. Study fast or slow—as you like. Diploma when you graduate. Mail coupon now. Paste it on a postcard or mail in envelope. ACTUAL LESSON FREE. Also 64 page catalog that shows opportunities, shows equipment you get. Cost of NRI courses low. Easy terms. **NATIONAL RADIO INSTITUTE, Dept. 7JB, Washington 16, D. C.**

N.R.I. TRAINED THESE MEN FOR SUCCESS

"I was repairing Radios by 10th lesson. Now have good TV job." M. R. LINDEMUTH, Fort Wayne, Ind.

"Doing spare time repairs on Radio and TV. Soon servicing full time." CLYDE HIGGINS, Waltham, Mass.

"I had a successful Radio repair shop. Now I'm Engineer for WHPE." V.W.WORKMAN, High Point, N.C.

"There are a number of NRI graduates here. I can thank NRI for this job." JACK WAGNER, Lexington, N. C.

VETERANS Approved Under G.I. Bills

SEND FOR BOTH FREE

National Radio Institute
Dept. 7JB, Washington 16, D.C.

Mail me Sample Lesson and 64-Page Catalog FREE. (No salesman will call. Please write plainly.)

Name_____Age___

Address_____

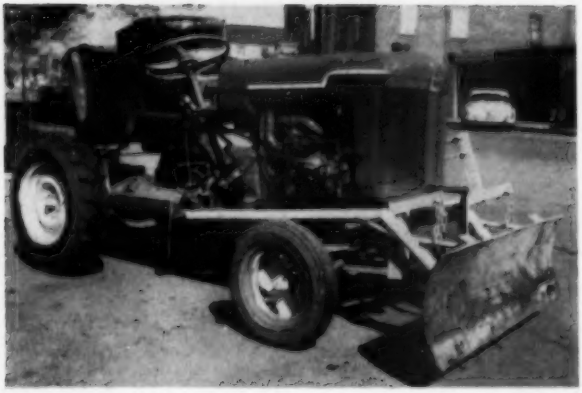
City_____Zone___State_____

Accredited Member National Home Study Council

Prize Projects BY PS READERS

Quarter-Scale Steamer. A fix-it shop proprietor with a yen for railroading, Frank Barto of Phoenix, Ariz., put 4,500 man-hours into his nine-ton, one-quarter size model of a Southern Pacific "Daylight" locomotive. Complete to roller-bearing driving boxes and sanders, it chuffs around a mile of circular track on the desert east of Phoenix. Three 20-foot orange-and-black coaches provide seats for 18 passengers.

He Even Made "Stones." A massive three-flue chimney provides both an indoor and an outdoor fireplace for the John Mihalicks of East Liverpool, Ohio. John cast the "stones" of concrete, using molds of three different lengths. The masonry job, including a 26-inch-thick reinforced footing, took two months of hard work but was well worth the effort, costwise. The bill for materials added up to a little under $200.



Tractor from Scrap. Garden plowing, grading and snow removal are a push-over for this 350-pound tractor, assembled from old auto and farm-machinery parts. Builder Bill Gustafson of Genoa, Ill., used a four-cylinder Continental engine from a combine and a Willys transmission to power it. Front and rear axles came from a 1938 and 1951 Plymouth, respectively; the rear wheels belonged to an old plow.

Have *you* recently completed a workshop project of which you are particularly proud? Send a good photograph of your work, along with the negative and a brief description, to the Mechanics and Handicraft Editor, POPULAR SCIENCE, 353 Fourth Ave., New York 10, N. Y. We will pay $15 for each item that is accepted for publication.

This Remington Typewriter PAYS FOR ITSELF Puts $10 to $50 in Your Pocket Every Week!

- *Exclusive Sale-by-Mail Offer!*
- *No salesmen, No Canvassers, No Representatives Ever Call!*
- *Typewriter Shipped to Your Door FREE Anywhere in U.S.A.*
- *100% Full Factory Guarantee!*

ATTENTION READERS! This $1-a-week offer plus FREE Gifts as shown below NOT available anywhere else—only by mail and only from Thoresen, Inc., 585 Water Street, New York 2, N. Y. Foremost coast-to-coast Remington Rand Distributor. Thousands of typewriters already mailed. Rush coupon below for yours TODAY!

Free

57 Ways to Make from $10 to $50 Weekly in Spare Time!

Along with your Quiet-Riter you receive the valuable, copyrighted manual "57 Ways to Make Extra Money with Your Typewriter." Truly a goldmine of help! Opens doors of opportunity you never knew existed. Shows you what to do, how to do it, step by step. Housewives, men, students in every walk of life now make good extra cash REGULARLY—including many WHO NEVER TYPED BEFORE! It's easy and it's fun! Work right at home in spare hours. No experience or special talents needed. Manual can be worth HUNDREDS OF DOLLARS to you in business secured—but it's yours FREE to prove to you, as we've proven to others, typewriter can PAY FOR ITSELF! But this manual is ours alone, cannot be bought anywhere.

Free

500 Firms Who Use Typewritten Lists—Some in Your Vicinity!

These firms are swamped with MILLIONS of envelopes, cards, letters to address. They LOSE MONEY if they don't have enough help to get the work done. Get your share of this business. No matter where you live, there are firms in YOUR VICINITY! Earn $1.00 to $2.00 an hour—and more—in spare-time work—often RIGHT AT HOME! We list names, addresses & the right people to contact. No time, effort or expense spared to compile this valuable list. This list cannot be purchased anywhere—ours alone! Yet we give it FREE with your typewriter!

This amazing $1-a-week offer plus FREE gifts available only by mail—and only from famous THORESEN, Inc., 585 Water Street, New York 2, N. Y., foremost coast-to-coast Remington typewriter distributor and dealer!

Free

We Pay ALL Shipping!

Your typewriter comes in its original factory-sealed carton with Remington's guarantee of Satisfaction, Protection, and Service IN WRITING and is delivered PREPAID. We pay all handling, crating, shipping and insurance costs. You don't pay another cent until 30 days AFTER you receive & are using the machine. Even then you remit only $1 a week, paid monthly. We ship anywhere in U.S.A. Everything done by mail. No salesmen ever call. This is the one and only offer of its kind in America! Thousands of typewriters already distributed to folks. Letters of praise pour in almost daily. "I've earned $22.00!" . . . "Typewriter is beautiful!" "Son's marks up 10 points!"

Free

SELF-INSTRUCTION BOOK

Starts you on "touch typing" in 5 minutes! Same principles as $40.00 business college courses—yet you pay not one cent for our accelerated "course-in-print." Everybody learns how to type—from junior to dad himself!

Free

Carrying Case Free of Any Extra Cost!

Luxurious! Handsome! As elegant as a fine piece of luggage—with safety lock—yours free of any extra cost.

Hurry! This is the offer you've seen advertised in The American Home, VFW, Moose and Elks Magazines, N. Y. Herald Tribune, Harper's Bazaar, Puck, etc. Typewriter shipped on first-come, first-served basis. Don't lose out on the most sensational offer of its kind! This offer is ours exclusively—only by mail—Only from us! Mail coupon with only one dollar for everything!

SENSATIONAL GOOD NEWS! Now you may have the brand-new, latest-model Remington Quiet-Riter shipped to you by mail for only $1. Yes, just ONE DOLLAR brings you the most modern, most advanced, most beautiful portable in the world—and in your choice of exciting decorator colors!

REMINGTON PAYS FOR ITSELF—MAKES MONEY FOR YOU!

Yes, along with your typewriter, you receive our copyrighted manual that shows you how to make from $10.00 to $50.00 a week with your typewriter . . . in your spare time RIGHT AT HOME! This manual is ours exclusively. It cannot be purchased anywhere, at any price. It helps you make your Remington PAY FOR ITSELF—even bring you a weekly profit! And it's yours FREE—available only from us by mail!

STUDENTS WHO TYPE GET 38% BETTER GRADES!

What will YOUR children be when they grow up? Tests in leading educators prove that boys and girls who type get up to 38% better grades. Typewritten work is neater, easier to read—and study from! Teachers like to receive typed reports, homework, compositions, etc. A Quiet-Riter is one of the finest investments you can make in your children's future. It inspires them to do even better school work, helps them forge ahead in class after class, become LEADERS! And the Quiet-Riter keeps helping your children in elementary school, in high school and right through college!

SAVE MONEY! DIRECT TO YOU AT LOW FACTORY PRICE!

The Quiet-Riter is a streamlined masterpiece that performs like big office machines that cost $275.00 plus tax. It has a full office-size 88-character keyboard and other office machine features. Many business firms, doctors, lawyers and other professionals—who could easily afford to pay $275.00—actually POWER the Quiet-Riter for their offices and homes. Yet the Quiet-Riter (Remington's very best home typewriter), is factory-priced at LESS THAN HALF THAT $275.00 FIGURE . . . only $139 plus tax. YOU SAVE MONEY! Best news of all, you pay only $1 now and just a $1 a week—paid monthly. TAKE 3 FULL YEARS TO REMIT! Everything done by mail!

BUILT TO LAST A LIFETIME!

A typewriter will be used by every member of the family for years and years . . . and years! It should be built to withstand rugged use and handling. Don't "sink" your money into cheaper, inferior models that may fall apart after six months—then bring you aggravation and mounting repair bills.

These models have FEWER keys, FEWER features, are much SMALLER, have INFERIOR construction, and their resale value depreciates fast to "almost nothing." Don't be penny wise and pound foolish! The best is the most economical in the long run. Your Quiet-Riter is built to last . . . with ordinary attention, a full LIFETIME! What's more, it has higher cash value, HIGHER re-sale value, HIGHER trade-in value. It's favorite among writers, executives, teachers, students, housewives—and small business-men too!

RUSH $1 Now Before Our Offer Ends! But you must act now. Even Remington with its vast production facilities cannot keep up with the demand. Mail this coupon below with one dollar.

RUSH ONE DOLLAR FOR TYPEWRITER!

THORESEN, Inc., Dept. 7-K-145
585 Water Street, New York 2, N. Y.

Here is my dollar (cash, check or money order) toward delivery of the new Remington Rand Quiet-Riter. Include carrying case, typing manual FREE, and valuable manual on how I can earn up to $50.00 a week a-se FREE. Only after I receive my typewriter, will I send you $1 weekly.

CHECK THE TYPEWRITER COLOR YOU WANT
☐ Gray ☐ Green ☐ Brown

PRINT NAME .....

ADDRESS .....

CITY ..... ZONE ..... STATE .....

☐ Check here if under 21 ☐ Check here if housewife

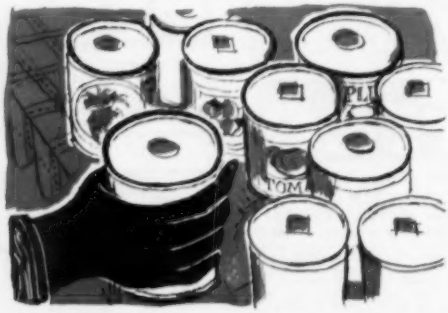
"I'd like to see them make..."

AN EASY-TO-PUT-ON DOG HARNESS with the buckle at the shoulder. Dogs are aware that the harness means an outing, and do a lot of wriggling.—*William Lurgio, Chicago.*

CAR UPHOLSTERY APPLIED IN LAYERS, so a section could be peeled off when soiled or worn to reveal a new seat cover or door liner underneath.—*Mrs. S. Sorensen, Mira Loma, Calif.*

IMPROVED ELECTRIC JUNCTION BOXES with built-in, insulated terminals. They'd let you splice wires without twisting, soldering and taping them.—*I. W. Linzmeier, Reedley, Calif.*

PAINT-STIRRING SPRAY GUNS with an air-operated paddle wheel to agitate the paint. Heavy pigments wouldn't settle to the bottom as you sprayed.—*Bruce Stewart, Winder, Ga.*



FOOD CANS WITH TOP MARKINGS to give you at least a clue to the contents if a label is torn off. A circle could indicate fruit; a square, vegetables; and so on.—*D. Lucke, Winona, Minn.*

Everyone has his own pet idea of a gadget that he would like to see in general use. The five ideas illustrated above were suggested by POPULAR SCIENCE readers. What is *yours?* We will pay $5 for each one published. Please use Government postcards only. Write name and address clearly. Contributions cannot be acknowledged or returned.

LET DeVRY TECH PREPARE YOU IN SPARE TIME AT HOME AS AN

ELECTRONICS TECHNICIAN

NO PREVIOUS TECHNICAL EXPERIENCE OR ADVANCED EDUCATION NEEDED!

Laborers and bookkeepers, store clerks, shop men, farmers, salesmen — men of nearly every calling — have taken the DeVry Tech program and today have good jobs or service shops of their own in Electronics. You don't have to quit your present job. If you are 17 to 55, see how you may get yourself ready for a future in the fast-growing Electronics field.

Whether you prepare at home or in our well-equipped Chicago or Toronto Laboratories, you get sound, basic training in both principles and practice. At home, you use educational movies. You build actual circuits and test equipment. You read simple directions, follow clear illustrations. When you finish, you are prepared to step into a good job in an excitingly different field. You may even start a service shop of your own. Mail coupon for free facts today.

Live-Wire Employment Service

Puts you in touch with job opportunities—or helps you toward a better position in the plant where you are now employed.

Draft Age?

We have valuable information for every man of draft age; so if you are subject to military service, be sure to check the coupon.

A SAMPLE LESSON FREE

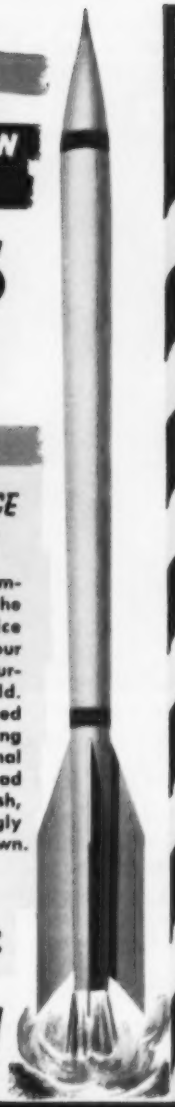
See for yourself how DeVry Tech trains you for real opportunities in Electronics. We'll also give you a free copy of an interesting booklet, "Electronics and YOU."

"One of North America's Foremost Electronics Training Centers"

Accredited Member of National Home Study Council

DeVRY TECHNICAL INSTITUTE
CHICAGO 41, ILLINOIS
FORMERLY
DeFOREST'S TRAINING, INC.

26 YEARS DeVry Technical Institute



AN INDEX to a BETTER JOB, A BRIGHTER FUTURE

- Electronics
- Radar
- Guided Missiles
- Television
- Micro-Waves
- Communications
- Radio
- Industrial Electronics
- Computers
- Automation Electronics
- Remote Control Systems
- Broadcasting
- Your Own Service Shop

MAIL TODAY FOR FREE FACTS

DeVry Technical Institute
4141 Belmont Ave., Chicago 41, Ill., Dept. PS-9-N

Please give me a FREE Sample Lesson and your booklet, "Electronics and YOU."

NAME _____ AGE _____
Please print
STREET _____ APT. _____
CITY _____ ZONE _____ STATE _____

☐ Check here if subject to military training.

#1090 DeVry Tech's Canadian Training Center is located at 626 Roselawn Avenue, Toronto 12, Ontario

Your carburetor needs a cleanout now!

Dirt, gum and varnish accumulate constantly in the carburetor of every car. And you'll see a big difference when you clean yours. You'll get—

Smoother Idling
Faster Acceleration
Greater Power

It will save you money, too, in gasoline mileage and repair bills.

Carburetor cleaning is easy with GUMOUT . . . and inexpensive. Simply add GUMOUT to your gas tank. It cleans as you drive. Or your serviceman will run GUMOUT directly through your carburetor while you wait.

Get GUMOUT today from any auto supply store, or wherever automotive products are sold. There's nothing like it!

***Send for* FREE**
Service Bulletin No. 104
"ROUGH IDLING—CAUSE AND CORRECTION"

GUMOUT DIVISION
Pennsylvania Refining Company, 2670 Lisbon Road, Cleveland 4, Ohio

You ought to know...

The final, delicate part of launching the earth satellite—nudging it off the last rocket stage into just the right orbit—will be accomplished by a device that looks like a Rube Goldberg creation (see sketch). When the rocket's acceleration drops to a pre-set figure, a weight will release a clockwork time fuse. After 27 seconds, this will fire explosives to knock out pins and release a spring. The spring will give the ball a two-mile-an-hour shove away from the rocket (rocket and ball at that point will have hit 17,600 m.p.h.).

What the satellite will do up there has now been settled, too. There will be a series of seven test shots (to be completed any

Drop in acceleration lets weight release timer, firing explosive charge that frees locking pins . . . Spring then shoves ball into orbit

time now) and six real tries (beginning next spring). The six for-real satellites will each carry one of four different instrument packages: (1) ionization chamber to measure the sun's ultraviolet radiation; (2) Geiger counter to monitor cosmic rays, plus gauges on the outside to record impacts with tiny meteors; (3) magnetometer to test the earth's magnetic field, and also an inflatable ball that will be tossed out to check on air density; (4) meteorological devices to measure either heat balance over the tropics or the earth's cloud distribution.

There are six satellites for the four kinds of instrument package in case something goes wrong with any of the firings.

The '58 cars are coming up. The full Edsel story is in this issue, pages 98 and 242. For the others, here's what to expect:

- Ford: completely new engine; very extensive restyling.
- Chevy, Pontiac: both brand-new, bumper to bumper.
- Plymouth and the rest of the Chrysler line: staying with a good thing, making only minor face lifts. There may be two new engines, plus Bendix fuel injection.
- Buick, Olds, Caddy: reported to have new suspension systems.
- Merc: a new line of engines plus sheet-metal changes.
- Lincoln: the world's longest auto, reports say.
- Rambler: gingerbread is off, for a completely new look.
- Studebaker, Packard: a new hardtop plus a Packard version of the Hawk.

A hard look at the young family's money problems by a California social worker has resulted in an up-to-date budgeting scheme (see the chart on page 18) that can help you make your purse match

You ought to know...

your needs. The figures show what percentages of your income should be allotted for different purposes. For instance, if you earn $7,000 a year, you ought to be able to allow $350 to $1,050 a year for installments on a new TV, refrigerator and so on. (Be sure you get the right money in the right bracket, though; car payments belong under transportation, mortgage payments under housing.) The chart is adapted from Frances Lomas Feldman's *The Family In a Money World* ($2.50, Family Service Association of America, 215 Fourth Ave., New York 3) . . . Speaking of budgets, pants for Dad and his sons that wear two-thirds longer, at a price increase of about 25 percent, will be in stores this fall. A new kind of nylon called "420" is woven with cotton (for work pants) and with rayon (for dress slacks) . . . Regular telephone calls at down-to-earth prices from airliners in flight are being tried. Rates: $1.50 to $5.25 for first three minutes.

How much should you spend on what?

Yearly Income	$4,500	$6,500	$12,500
Food	25-35%	20-30%	15-25%
Housing	18-30%	15-25%	15-25%
Clothing	9-13%	9-15%	9-15%
Transportation	7-10%	7-12%	7-15%
Taxes	6-8%	12-15%	20-30%
Health and insurance	7-10%	7-12%	7-15%
Savings	0-10%	0-10%	5-15%
Gifts, education, etc.	4-10%	5-10%	5-15%
Installment payments	5-15%	5-15%	5-15%
Household help	0-5%	0-10%	5-15%

Is the shortage of engineers over? This could affect your job and the jobs your children will have, since practically all work depends on engineering and science nowadays. The professional trend-watchers see signs of an end to the talent drought: (1) It was easier to hire young engineers this spring. Starting salaries were higher than ever, though. (2) Employers are buying less space for help-wanted ads. But though the sizes of the ads are down, the number of ads is up. (3) Maybe the shortage was overdramatized to begin with. A serious scarcity would have forced engineers' pay up more than other salaries. This didn't happen. The true shortage is trained talent—all kinds. Here's why:

Our country is growing, its life is more complex. So we need more and more specialists—machinists, technicians, architects, doctors, administrators—not just engineers.

The big need for engineers is in the production of hard goods: weapons, autos, TV sets, refrigerators. Although the demand for these has leveled off recently, reducing job opportunities, the value of the things and services we produce and the money we have to spend are still near record heights.

So the outlook for engineers *and other* trained specialists is very good, if not as lush as some high-pressure promotion made it seem. As long as the country continues to grow, we'll need more skilled people than we have.

Title registered, contents copyrighted

Here's the BEST DEAL YET-

for the man who needs a BETTER JOB-MORE MONEY

R. C. ANDERSON
President
CTI

If you're just "breaking even"... if you're "in the hole" every month ... if your wife wants to look for work—you need *more money, a better job!* You can *have* a good job with top pay and security in the old, established, but *fast-growing* Air Conditioning and Refrigeration industry. This field needs 20,000 newly-trained mechanics every year. It needs ambitious men to open service shops. *It needs you!* Don't say you're no mechanic! We know that. We also know *we can train you at home* to become a skilled mechanic. CTI has a real good deal for you. *Just fill in and mail coupon* and we'll rush full details.

NOW YOU CAN LEARN
AIR CONDITIONING
AND REFRIGERATION
by practicing at home with real equipment!

YOU GET "FIELD EXPERIENCE" AS YOU TRAIN

You train at home in spare time. CTI sends you 23 big kits of parts and tools. You assemble a commercial-type, heavy-duty, ¼ h.p. refrigeration high-side (illustrated at right.) Then you build an air conditioner, refrigerator, freezer or milk cooler. All equipment included with training! No extra cost.

You Get Kits Like These

At left is photo of tools included in just *one* kit. You get other tools, tubing, much equipment. Kits are sent on a planned schedule so that you learn in easy stages. You learn fast, too!

In another kit (right) you get motor, fan, pulley, service tools. Kits develop skill, let you get experience, eliminate years of low-pay apprenticeship.

Add to Your Income by Earning Cash as You Train

CTI training is practical, just like working on actual jobs. Like other students, you'll want to do repair work for profit soon after starting. Many students pay their tuition this way, add to their incomes, even get started in a business. Get the facts about this. *Mail coupon.*

COMMERCIAL TRADES INSTITUTE • 1400 Greenleaf Ave. • Chicago 26, Illinois

YOUR BIG CHANCE TO OPEN A SERVICE SHOP

Want to be independent—be your own boss? The air conditioning and refrigeration field is one of the best. It's big, uncrowded, packed with opportunity. Start small and grow big. Many students do service work on a monthly fee basis—do repairing for shops, food stores, meat markets, etc. Others answer home calls. In time, they build up a customer list, open a shop. You could, too!

FIRST GET THE FACTS—THEN DECIDE

MAIL COUPON TODAY FOR 2 FREE BOOKS

COMMERCIAL TRADES INSTITUTE
1400 GREENLEAF AVENUE DEPT. R-396
CHICAGO 26, ILLINOIS

Rush me your booklet, *Success in Air Conditioning & Refrigeration*, and *Sample lesson*. Both FREE.

Name_____ Age____
Address_____
City_____ Zone____ State____

"TRAINING YOU CAN TRUST"

"The battery backed up by 2,000,000 miles of testing"

Auto-Lite Sta-ful is tried, tested, and proved for long life and quick, easy starts in the coldest weather. Two years and more than 2,000,000 miles of testing showed the following results:

- Not one battery failed.
- 95% gave better cold-weather starting than required of *new* batteries.
- None of the batteries needed water more than 3 times a year.

You just can't buy a better battery at any price!

NEEDS WATER ONLY THREE TIMES A YEAR*

*IN NORMAL CAR USE

6 or 12 volt

Dry Charged...
Fresh when you buy!

Find Us Fast In The Yellow Pages

OTHER AUTO-LITE BATTERIES AS LOW AS $13.95

AUTO-LITE MANUFACTURES OVER 400 PRODUCTS, INCLUDING SPARK PLUGS, BATTERIES, WIRE AND CABLE, AND AUTOMOTIVE ELECTRICAL SYSTEMS . . . SOLD THROUGHOUT THE UNITED STATES AND CANADA.

Now available...direct to you from the Publisher

BRAND NEW EDITION OF THE WORLD FAMOUS

ENCYCLOPAEDIA BRITANNICA

On Easy...Book a Month Payment Plan

■ The Encyclopaedia Britannica has always been the symbol of a good home . . . a cherished possession every one dreams of owning one day. And now those dreams can come true today. The Encyclopaedia Britannica has developed a new plan that makes ownership of this world famous encyclopaedia as easy as buying a book a month.

All 24 volumes of the handsome brand new edition of the Encyclopaedia Britannica can be your proud possession *now* – to use, to read, to enjoy while you pay for them on an easy Book A Month Payment Plan.

Makes your home the most interesting place in the world

Whether you or the children in your family are interested in atomic science or art, medicine or farming, foreign countries or American Indians, ancient Rome or courageous present-day Hungary, the Encyclopaedia Britannica will provide a lifetime of fascinating reading. Its pages are filled with 23,494 magnificent pictures that identify by sight everything from breeds of horses to the jungle tribes of Africa.

Essential for your children

No child can help being stimulated to wider interests and a more active mind that will show up in better work at school when this great treasure house of knowledge, the one and only Encyclopaedia Britannica, is in your home.

You, too, will be a more interesting parent for your child if you can share his interests, discuss his views, add to his understanding from your own reading of this the largest and most complete reference library published in the English language. You'll find your new knowledge will reflect in your social and business life, too, to bring you the popularity and success an easy, interesting conversationalist always attracts.

No one ever outgrows it!

No person . . . no home can afford to be without the Encyclopaedia Britannica. It is the one encyclopaedia no one ever outgrows . . . the encyclopaedia that is always kept current. Each year your set of the Encyclopaedia Britannica is supplemented with a new Book of the Year which includes every important new event, discovery, and fact. It is so detailed and so complete you can find in the current Year Book, for example, new medical discoveries, a description of Grace Kelly's wedding or the number of peanuts produced in the U.S. last year.

FREE Research Service

And if, by any chance, you want a more comprehensive report on some subject, you are entitled, as a Britannica owner, to the services of the Britannica Research Staff free of charge. On request, they will supply you with an authoritative report on subjects of interest to you—how to plan for retirement, facts on buying a home, information on sports, politics, world affairs, family life, music, art—whichever is the subject of your choice. This service becomes available to you free of charge the day you become a Britannica owner. And you can become a Britannica owner *today* with the easy Book A Month Payment Plan. It's just like buying a book a month!

Preview Booklet Free to You!

The coupon below entitles you to a free, full-color booklet of the new edition of the Encyclopaedia Britannica. Send for it and examine it. Notice the interesting, readable way the accumulated knowledge of the world is presented to you in easy-to-grasp and easy-to-remember language. Enjoy the fascinating illustrations of a rocket trip to the moon, the magnificent scenery of our own country, exotic pictures of the Orient and Europe. There is no obligation on your part. This preview booklet is offered as a service by the Encyclopaedia Britannica so that you can see for yourself why it is world-renowned as the finest of all the encyclopaedias. The printing of this booklet is for preview purposes and is therefore limited. We suggest you mail in the coupon below today while copies last to make sure you get yours.

Mail Coupon Now for FREE Booklet

ENCYCLOPAEDIA BRITANNICA, Dept. 12G
425 N. Michigan Avenue, Chicago 11, Illinois

Please send me, *free and without obligation*, your colorful Preview Booklet which pictures and describes the latest edition of ENCYCLOPAEDIA BRITANNICA in exciting full detail. Also include complete information on how I may obtain this magnificent set, *direct from the publisher* on the Book a Month Payment Plan.

Name _____
(please print)

Address _____

City _____ *Zone* _____ *State* _____

In Canada, write E. B. Ltd., Terminal Bldg., Toronto, Ont.

Learn at Home
in your spare time
to Fix Electric Appliances

Better Pay—More Opportunities

Get into a field where there is important work and opportunity for the trained man. Millions of electric appliances are sold every year. Every wired home now has an average of 8. Many of them need service and repair. Owners pay well to have them fixed quickly, properly. This is your opportunity for a better job, your own part time or full time business. NRI can give you the training you need, at home, in your spare time.

Spare Time Earnings Start Soon

Soon after starting you will be able to earn extra cash fixing toasters, clocks, fans, vacuum cleaners, etc., for neighbors and friends. Keep your job while learning and earning. Put spare time to work for you. Work in your basement, garage, spare room. You'll be amazed how easily, quickly you, too, can start earning many extra dollars. NRI shows you how. Even before you finish training your spare time earnings may pay for the course and equipment.

NRI Sends Tester to Learn and Earn

You need proper equipment to service today's automatic appliances. With **this** course you get parts to build professional type, multi-use Appliance Tester. You learn to use it. Takes guess work out of servicing. Mail coupon for FREE book and Sample Lesson. See how easy it is to learn. Find out about NRI—a school that for more than 40 years has been training men, through home study, for success, good pay jobs. Our reputation, record, experience back up this course. Write now to: National Radio Institute, Dept. BJ7, Washington 16, D. C.

FREE *Lesson and Book Mail this NOW!*

NATIONAL RADIO INSTITUTE
Dept. BJ7, Washington 16, D. C.
Send me Lesson and Book Free. No Salesman will call.

Name.....Age.....

Address.....

City.....Zone.....State.....

ACCREDITED MEMBER NATIONAL HOME STUDY COUNCIL

MAKE BIG PAY!

Make big pay in the construction industry as an operator of Bulldozers, Draglines, Back Hoes, Scrapers, and Motor Graders. Learn these skills NOW! Contractors need operators of earthmoving machines and pay high wages to our graduates. Don't be satisfied with just a job . . . learn a career!

Write TODAY for FREE School Catalog, no obligation, to either address

National School of Heavy Equipment Operation	Western National School of Heavy Equipment Operation
P.O. Box 8243, Dept. A-4 Charlotte, N. C.	P.O. Box 527, Dept. A-4 Weiser, Idaho

LEARN TO MOUNT BIRDS

ANIMALS, FISH, PETS

Be a Taxidermist. Save your hunting TROPHIES. Have a fine home-museum. Hunters, save and **MOUNT** your beautiful DUCKS, QUAIL, DEER, **TAN** skins, FURS. **Great Fun.** Spare-time **PROFITS.**

FREE BOOK Tells ALL about it. 100 fine wild-game pictures, 48 pages. SEND TODAY, don't delay. Get this WONDERFUL **FREE BOOK,** MEN AND BOYS. Learn Taxidermy. Double your hunting pleasure. Rush letter or **POSTAL** today. **STATE YOUR AGE.**

N. W. SCHOOL OF TAXIDERMY, Dept. 2609 Omaha, Neb.

NEW! HMS BOUNTY MODEL KIT!

Famed mutiny ship. Every detail accurate—cannon, launch, rigging. Precision plastic parts, cement, plans. 14⅜". $2.98. For catalog, send 10c to Dept. S-9 4223 Glencoe, Venice, Cal.

$2.98

wherever hobby kits are sold Revell

NOW The Short Cut to Learning You've Been Waiting for

LEARN "BY EAR" WITH THE

DORMIPHONE

A Scientific Discovery that Works for You . . . Awake and Asleep

Now, at last, an easy shortcut to learning. With this amazing new tool, you *"start" to learn while awake*—then the Dormiphone takes over *while you go off to sleep.* Do you want to learn a language—memorize a speech, facts, figures, formulae—correct your speech—break bad habits? The Dormiphone SAVES YOUR TIME—EFFORT. Simple—helpful—practical. Used by educators, psychologists, people of all ages, occupations. Find out HOW the Dormiphone works. Write for FREE Book—Get the Scientific Evidence *Today.*

MODERNOPHONE, INC. 262-097 Radio City, New York 20, N.Y.
Gentlemen: Please send me your FREE Book.

NAME.....

ADDRESS.....

CITY.....ZONE....STATE.....

My main interest in Dormiphonics is for:

( ) Learning a Language ( ) Speech Improvement
( ) Memorization ( ) Sleep Inducement
( ) Habit Correction ( ) School or College Work

INVENTORS

Learn how to protect your invention. The U. S. Patent Laws provide that any new and useful art, machine, article of manufacture, or composition of matter, or any new and useful improvement thereof, may be patented if the act of invention is involved. Therefore, every inventor with a valuable invention should take advantage of the Patent Laws and proceed for patent protection in order to safeguard his rights.

A patent gives the inventor the exclusive right to prevent others from making, using, or selling the invention claimed in the patent for a period of seventeen years.

The Patent Laws were enacted for the benefit of the inventor to give him protection for the features of his invention which are patentable. These features must be properly and concisely set forth and claimed in a formal application for patent, in order to comply with the requirements of the Patent Laws. For that reason, unless the inventor is familiar with patent matters, he should engage a competent registered patent attorney or agent to represent him. We are registered to practice before the U. S. Patent Office and are prepared to serve you in the handling of your patent matters.

A specially prepared booklet entitled "Patent Guide for the Inventor", containing detailed information with respect to patent protection and procedure, together with a "Record of Invention" form will be promptly forwarded to you without obligation upon request.

CLARENCE A. O'BRIEN & HARVEY JACOBSON

Registered Patent Attorneys

72-J DISTRICT NATIONAL BUILDING
WASHINGTON 5, D. C.

LIFT THE HOOD TO A BRIGHT FUTURE

That better job you've always wanted is waiting for you in the auto industry. Over 50,000 mechanics are needed—because about two-thirds of the 60 million cars and trucks on the road are in the "heavy repair" classification. *That spells opportunity for you!*

Want a good job? Your own shop? Learn

Auto Mechanics

Easy to train by practicing at home

Yes, Auto Mechanics offers interesting work, high hourly wages, security. You could even go in business for yourself when qualified! Best way we know to learn this respected craft is to *let CTI bring its original Shop-Method training to you at home.* Based on resident-school experience, this method trains you in every phase of mechanics, including: tune-up; overhaul; automatic transmissions; power systems; electric and cooling systems —"the works." *Mail coupon for two free books!*

EARN MONEY AS YOU TRAIN. Many students repair cars in spare time; others get jobs in local garages; some open shops by the time they graduate. Easy to learn-and-earn because CTI offers practical *Shop-System* training.

DIESEL MECHANICS OR BODY-FENDER REBUILDING is included at no extra cost. Only CTI offers this extra choice. Get this fully-rounded mechanic's training. *Send coupon for two free books.* Get facts now; decide later.

YOU PRACTICE WITH THIS TUNE-UP KIT

Kit includes a Compression Tester, a Vacuum Gauge and Fuel Pump Tester, an Ignition Timing Light, and a portable steel case. These professional instruments help you locate engine troubles, let you get useful practice. You keep this kit!

MECHANIC'S TOOLS TOO

You'll use these tools to get real experience. They'll increase your interest, stamp you as a "pro." You'll want to earn spare time cash with them. No extra cost for tools—you keep them.

MAIL COUPON TODAY!

COMMERCIAL TRADES INSTITUTE

1400 Greenleaf Ave., Dept. A-623
Chicago 26, Ill.

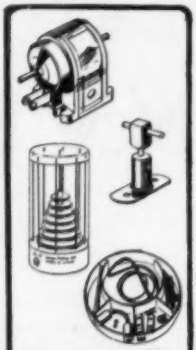
Mail book "Big Money in Auto Mechanics" and Sample Lesson. Both free.

Name_____ Age____

Address_____

City_____ Zone____ State____

"TINY ATOM" ELECTRIC MOTORS for HOBBY—RESEARCH—INDUSTRY



Order your choice of four miniature battery-operated motors—one for every use—from 1½ to 12 volts—and today's BIGGEST VALUES IN THE HOBBY FIELD. These motors, with the accessories in kits listed below, provide all types of drives for hobby items, toys, research and industrial devices. Make wonderful gifts.

No. 8-100 Hi-Drive Motor, 3-6V. **$2.50**
No. 9-100 Same for 12V **$3.00**
***No. 3-100** Tiny Atom Motor, 1½-3V. **$2.00**
For higher voltage.. **$2.50**
No. 3113N Tiny Atom motor assembly kit with many acc.. **$3.50**
***No. 26** Couplings kit..... **$1.50**
No. 12 Solid shaft supports kit **$2.50**
***No. 14** Adjustable shaft supports kit..... **$3.00**
***No. 77** Set of 7 large pulleys, 6 shafts and 3 belts..... **$3.00**
No. 3700 Large accessories kit **$3.00**
No. 3000 Vari-speed gear unit.. **$4.00**
No. 1049 Gear train with Hi-Drive motor No. 8-100.... **$5.95**
Same with No. 9-100 Motor.. **$6.45**
* Item illustrated. **Ask for FREE Cat.**

All Wilson's motors have Permanent Alnico Magnets.

Remit with order and we pay postage in U.S.A. No C.O.D. Add 3% Sales Tax for delivery in Ohio. Write Dept. PS

For quick delivery see your local dealer — or order direct

WILSON'S OF CLEVELAND
425 Lakeside Ave., N.W. • Cleveland 13, Ohio

AMAZING NEW "LIFETIME" RADIO

"TI-NEE" RADIO IS GUARANTEED TO WORK FOR YOUR LIFETIME! USES NO TUBES, BATTERIES OR ELECTRICAL PLUG-INS. Never runs down! SMALLER THAN A PACK OF CIGARETTES! RECEIVES LOCAL RADIO STATIONS MOST ANYTIME, ANYWHERE WITHOUT EXTRA ANTENNA. Uses semi-conductor crystal diode Hi-Q Tuner. Beautiful black gold plastic cabinet. **Built-in Speakerphone.**

SEND ONLY $2.00 (bill, ck, mo) and pay postman $4.99 COD on arrival or send $6.99 for postpaid delivery. SENT COMPLETE READY TO LISTEN—NOTHING EXTRA TO BUY EVER! Extra long distance Aerial kit included free to receive stations up to 1,000 miles away. Available only from!

MIDWAY COMPANY, Dept. GPS-9, Kearney, Nebraska

Eskelman GOLF CARS Also ideal for Airports Industrial Plants, etc. Write for literature.

ESKELMAN TRACTORS LOW AS $99

Plows-Cultivates-Saws Cuts-Dozer-Harrows Haults - Snow Plows-Rolls. Eskelman Tractors, Tillers, Riding Rotary Mowers for Better Lawns and Gardens. Advertised in GOOD HOUSEKEEPING. Thousands of satisfied users. Write for Free Literature.
Dept. 244, **ESKELMAN,** Balto. 2, Md.

Shipping Points: BALTIMORE • CHICAGO • RENO

Illus. MODEL 8869.78

4-WHEEL DRIVE OWNERS

21 MODELS INCLUDING JEEPS

NEW AXLE POSITIONER

. . . Instant, positive engagement

FRONT DRIVE WITH **FREE-LOCK HUBS**

LOW OPERATING COSTS

In 2-wheel drive no parts moving

NO Rocking to Engage Hubs

Engaging hub is instant and positive with the new Axle Positioner. First time available in any hub **Unconditionally guaranteed for 1 year!**

See your dealer or write for FREE literature.

FREE-LOCK CORPORATION
6301 N. Federal Blvd. • Denver 21, Colorado

INVENTORS

If you believe that you have an invention, you should find out how to protect it. The first step is to have a search made of the prior pertinent U. S. patents. If a report on this search indicates that the invention appears patentable you can apply for a patent, and the specifications and claims should be prepared.

The firm of McMorrow, Berman & Davidson, with offices in Washington, D. C., is qualified to take the necessary steps for you. We can make a preliminary search on your invention, advise you whether we think it can be patented, and prepare your application for patent.

Unless you are fully familiar with the U. S. Patent Laws, we recommend that you engage the services of a Registered Patent Attorney to protect your interests. The patent laws are *your* laws. A patent gives you the right to prevent others from making, using or selling the invention claimed in your patent for a period of 17 years.

Use these patent laws for your protection. Investigate whether your invention can be patented. If you have what you believe to be an invention, we suggest that you have this firm make a search for you.

Send for a copy of our Patent Booklet entitled "How To Protect Your Invention," containing information about patent protection and patent procedure. Along with this we will also send you an "Invention Record" form, for your use in writing down and sketching details of your invention. We will mail them promptly. No obligation. They are yours for the asking.

McMORROW, BERMAN & DAVIDSON

Registered Patent Attorneys

PATENTS · COPYRIGHTS · PATENTS

142-C VICTOR BUILDING, WASHINGTON 1, D. C.

HOW TO FIX ANY PART OF ANY CAR

QUICKLY--EASILY--RIGHT!

FREE 7-DAY TRIAL

WHETHER you're a beginner or an expert mechanic — now you can "breeze through" any "fix-it" job from simple carburetor adjustment to complete overhaul. Just look up job in index of MOTOR'S Brand-New Auto Repair Manual. Follow simple step-by-step directions, clear pictures. Presto—the job is done!

No guesswork! MOTOR'S MANUAL takes you from "scratch" — shows WHERE to start, WHAT tools to use. Covers EVERY job on EVERY car built *from 1949 thru 1957!*

Everything You Need to Know "Boiled Down" from 160 Official Shop Manuals

BIG NEW, REVISED, ENLARGED, Edition contains the "meat" from over 160 OFFICIAL shop manuals—simplified for YOU! 25,438 essential repair specifications. Over 1,000 big pages. More than 2,900 "this-is-how" pictures. 225,000 service and repair facts. Leads beginners every step of the way. Time-saving factory repair procedures for experts. Instructions and pictures so clear you CAN'T go wrong. Used by U. S. Army and Navy.

Try Book FREE 7 Days

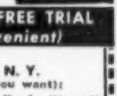
Just mail coupon. (Attach it to postcard, if you wish.) Make Manual show you what it's got. Unless you agree this is the greatest time and work saver you've ever seen—return book in 7 days and pay nothing. Mail coupon today to: MOTOR — Book Dept., Desk 29, 250 W. 55th St., New York 19, N.Y.

BrandNew—Covers All These Makes

Buick	Jeep
Cadillac	Lincoln
Chevrolet	Mercury
Chrysler	Nash
Clipper	Oldsmobile
Continental	Packard
De Soto	Plymouth
Dodge	Pontiac
Ford	Rambler
Hudson	Studebaker
Imperial	Thunderbird
	Willys

Same FREE Offer On MOTOR'S New Truck Repair Manual

Covers EVERY job on EVERY popular make gasoline and Diesel truck made from 1949 thru 1957. For FREE 7-Day Trial check proper box in coupon below.



MAIL COUPON NOW FOR 7-DAY FREE TRIAL
(Attach to Postcard if More Convenient)

MOTOR BOOK DEPT.
Desk 29, 250 W. 55th St., New York 19, N. Y.
Rush to me at once (check box opposite book you want):

☐ **MOTOR's** *New* **AUTO REPAIR MANUAL.** If O.K., I will remit $2 in 7 days, $2 monthly for 2 months and a final payment of 95c (plus 35c delivery charges) one month after that. Otherwise I will return the book postpaid in 7 days. *(Foreign price, remit $9 cash with order.)*

☐ **MOTOR's** *New* **TRUCK REPAIR MANUAL.** If O.K., I will remit $2 in 7 days, and $2 monthly for 3 months, plus 35c delivery charges with final payment. Otherwise I will return book postpaid in 7 days. *(Foreign price, remit $10 cash with order.)*

Print Name..... Age.....

Address.....

City..... State.....

☐ **Check box and save 35c delivery charge** by enclosing WITH coupon in envelope entire payment of $6.95 for Auto Manual (or $8 for Truck Manual.) Same return-refund privilege.

college graduates get ahead faster!

You see it in your own city. They have higher incomes . . . advance more rapidly. Grasp *your* chance for a better life. Industrial growth . . . automation . . . technical advances create career opportunities for engineers, accountants, management experts. Share rewards awaiting college-trained men. Important firms visit campus regularly to employ Tri-State College graduates. Start any quarter in this world-famed college. *Approved for veterans.*

Bach. of Science degree in 27 months

in Mechanical, Civil, Electrical, Chemical, Aeronautical, Radio (TV-Electronics) Engineering. *In 36 months a B.S. in Business Administration* (General Business, Accounting, Motor Transport Management majors). Superior students may accelerate. 36-weeks course in Drafting. *Intensive program:* technical fundamentals stressed; comprehensive courses with more professional class hours. *Small classes:* personalized instruction. Enrollment limited to 1550. Preparatory courses. *Beautiful campus.* Well-equipped, new and modernized buildings and laboratories. Enter Sept., Jan., March, June. Earnest, capable students (whose time and budget require accelerated courses and modest costs) are invited to *write Jean McCarthy, Director of Admissions, for catalog and book "Your Career in Engineering and Commerce."*

TRI-STATE COLLEGE
597 College Avenue Angola, Indiana

MONEY for MEN ALL DATA FREE

THE PLASTEX Industry needs manufacturers on small scale and for big production of Lamp and Clock Stands, Art Goods and Novelties in Plastex and Marble imitation. Experience unnecessary. Use material makes regular 10c store sellers. Rubber moulds furnished for speed production. Small investment brings good returns. We are now placing big chain store orders with manufacturers. Ambitious men have chance for real prosperity. Our Free booklet will interest and benefit you.

PLASTEX INDUSTRIES, Dept. 2, 3400 Third Ave., New York 56, N.Y.

LAW FREE BOOK

THE LAW TRAINED MAN

Write today for a FREE copy of illustrated law book, **"THE LAW-TRAINED MAN,"** which shows how to earn the professional Bachelor of Laws (LL.B.) degree through home study of the famous Blackstone Law Course. All necessary books and lessons provided. Moderate cost; convenient monthly terms. Write for FREE law training book today.

Blackstone School of Law, 307 N. Michigan Ave.
Founded 1890 **Dept. 126 Chicago 1, Ill.**

Enjoy a Pipe

30 Days FREE—at my risk!

The claims about my new kind of pipe are too spectacular for pipe-smokers to believe. That's why all I want is your name—so I can write and tell you why I'm willing to send you my London-made Briar pipe for 30 days smoking pleasure **without a cent of risk** on your part. You are the sole judge—no obligation. FREE! Write today.

E. A. CAREY, 1920 Sunnyside, Dept. 13-K, Chicago 40, Ill.

Let me show you

HOW TO SPEAK AND WRITE LIKE A COLLEGE GRADUATE

I have helped thousands of men and women who have not had college training in English to become effective speakers, writers, and conversationalists. With my new C. I. METHOD, you can stop making mistakes, build up your vocabulary, speed up your reading, develop writing skill, learn the "secrets" of conversation. You don't have to go back to school. Takes only 15 minutes a day at home. Costs little. 32-page booklet mailed FREE upon request. Send me a card or letter TODAY!

DON BOLANDER, CAREER INSTITUTE
Dept. 1079, 25 East Jackson, Chicago 4, Illinois
Please mail me your FREE 32-page booklet on English.

Name _____
Address _____
City _____ Zone _____ State _____

BARGAINS

BUY

GET

IS THE ONLY BIG TABLOID PUBLICATIONS in Existence That Tells You WHERE & HOW —EVERY MONTH—

- To Buy Bankrupt, Closeout, Surplus Bargains!
- To Buy Items at Wholesale! • At Below Wholesale!
- To Buy New & Unusual Items!
- To Obtain Information on

Rare Money Making Offers!

Toys, Books, Jewelry, Greeting Cards, Cosmetics, Household Merchandise, Appliances, Industrial Materials, Machinery, Tools, etc.

Often Low as 10c-25c on the Retail Dollar!!

ONE issue of this Sensational NEW publication can save you MORE MONEY than the cost of the entire subscription! BUY BETTER, CHEAPER, NEWER THINGS EVERY MONTH OF THE YEAR! You absolutely need every single issue of BARGAINS in order to get the MOST FROM EVERY PENNY YOU SPEND. Each issue carries HUNDREDS of bargain offers . . . many times SO EXTRAORDINARY that it's hard to believe that they're GENUINE! Buying at WHOLESALE, BANKRUPT, SURPLUS, CLOSEOUT PRICES can save you from 40c to 80c or more on every dollar you spend! THIS MAY BE HARD TO BELIEVE, BUT IT IS THE TRUTH!

DON'T Take Our Word For It — Here's What Subscribers Say About "BARGAINS"!

". . . Received my 1st issue and may I say IT IS A GREAT MAGAZINE."
—M. C., Ark.

". . . I am very pleased with BARGAINS. I have never seen anything like it."
—Mrs. D. M., Maine

". . . Just received my 1st copy of "Bargains" and believe me, it is all that you claimed it to be."
—T. A., N. Y.

". . . I was the recipient of my 1st copy a few days ago. I am completely satisfied with the periodical. I shall be pleased to continue my subscription as long as the magazine is available."
—W. S., Wash.

Every One OF THESE LETTERS ARE IN OUR FILES & WERE NOT SOLICITED IN ANY WAY OR MANNER!

Make FANTASTIC PROFITS Buying Up Bargain Merchandise CHEAP and Selling It CHEAP

Thousands of Salesmen, Dealers subscribe to "BARGAINS." They want to know where to buy BEST to sell at low prices for BIG PROFITS. NO REASON why you CAN'T DO THE SAME! Special articles in BARGAINS give you valuable tips on HOW to sell these bargins for BIG PROFITS.

"Subscribers Shopping Service Enables You to Buy Big Name Merchandise at TREMENDOUS SAVINGS"

You won't find this feature in ANY OTHER MAGAZINE, ONLY "BARGAINS." For subscribers, each month it negotiates bargain offers in famous merchandise at LOW WHOLESALE PRICES and then offers them to subscribers AT NO PROFIT! Enables you to buy in small lots—singly or in quantity at the same prices (sometimes lower) that dealers pay! This SINGLE FEATURE OF BARGAINS IS WORTH THE LOW SUBSCRIPTION PRICE A DOZEN TIMES OVER.

ONLY Publication of Its Kind!

Search your newsstand high and low. You won't find another publication like it! BARGAINS is available by subscription ONLY. Read the glowing letters by subscribers who WERE AMAZED by this sensational publication!

SAVE—EARN Up to $3,000!

We honestly believe that it's possible to SAVE up to $1000—and EARN up to $3000, within a year by reading "BARGAINS" EVERY MONTH! WHY NOT PROVE THIS FOR YOURSELF!

Your subscription automatically includes the BIG 1957 CHRISTMAS SPECIAL ISSUE . . . jam full of terrific, eye opening holiday BARGAINS!

NEW! List of Terrific Foreign Bargains!

Every issue news about wholesale foreign merchandise buys you can make direct! Also news of foreign exporters, mfgs. looking for U. S. agents!

$2.00 Per Year—12 Big Issues

(Regular price, $3.00 per Year)

Special Limited Time Offer to Get 10,000 New Subscribers!

Your Money Back IN FULL If the First Issue Doesn't Please You!

LET'S FACE IT . . . Claims, promises are easily made on paper. Can you go wrong in subscribing on this ironclad MONEY BACK GUARANTEE . . . Your money back IN FULL if the first issue that you receive doesn't please you! Can any offer be more POSITIVE, more FAIR than this POWERFUL guarantee?

Tower Press, Inc., Box 591, Lynn 831, Mass.

FREE DIRECTORY

100,000 ITEMS WHERE TO BUY-IT-WHOLESALE

BIG 1957 EDITION

- **Lists HUNDREDS of Sources for WHOLESALE Bargains!**
- **Lists HUNDREDS of Surplus, CLOSEOUT, BARGAIN offers!**
- **Special lists of WHOLESALE, CLOSEOUT JOBBERS!**

This Directory, being sold for $1.00 per copy, is yours free with your 1 years subscription to "Bargains"!

Here's a FEW Samples of the Bargains Usually Found in "BARGAINS"!

- PENCILS, 57½c per Gross!
- 25c Rudolph the Reindeer Brooches, 2c each!
- Plastic Toy Guns, 2c each!
- $1. Mufflers, Scarfs, 12½c
- Double edge razor blades, $1.50 per 1000!
- LADIES APRONS, 6¼c
- $2.50 WALLETS, 39c each!
- $1. val. BILLFOLDS, 15c
- $1. Kiddies handbags, 3c
- CIGARETTE HOLDERS, 1c
- BUTTONS, 144 for 25c!
- NEW Piano records, 78 & 45 r.p.m. 7c each!
- 69c Insect Repellent, 5c each!
- New 20" T.V. Pic. Tubes, $21.95 each!
- Famous brand $18.75 perfume $1. each!
- 49c Xmas window decorations, 10c per set!
- $1-$3 Hard cover books, 20c
- $200.00 Surplus Typewriters, $23.00 each!
- 50c Everyday greeting cards, 7c per box!
- $1.95 Men's Silk Ties, 12½c
- $1. val. personal cloth name tapes, 40c for 72!
- 39c Under arm deodorant, 2c jar!
- $1. Automatic card shufflers, 9c each!
- NEW HAIRNETS ½c each!
- $15.00 Electric Percolators, $5.00 each!
- $5.50 Lucite Hairbrushes, 65c each!
- New Bobby Pins, 70c per 700 pins!
- $19. Men's Toiletry Sets, 60c each!
- Calendar Wrist Watches, $5. each!
- Christmas Seals, 25c per 1000!
- $2.98 Horserace game records, 39c each!

- **PLUS HUNDREDS OF OTHER SENSATIONAL BUYS!**

(Above list merely illustrates type of bargains usually found in this paper. Lists naturally change from month to month.)

TOWER PRESS, INC., Box 591, Lynn 831, Mass.

O. K. Here's my $2.00 for 1 year subscription. Rush me 1st copy! Also my copy of the Free "Buy it wholesale" guide.

Name.....

Address.....

City..... State.....

Remember! Your Money Back in FULL if the 1st issue you receive doesn't please you!

particular drivers, particularly, need AjustOmatic Shock Absorbers

More and more owners of late-model, high-performance automobiles are demanding what only Gabriel AjustOmatic shock absorbers offer: • Freedom to choose soft, normal or firm ride—to suit your driving habits • A new experience in superior stability, control and roadability.

Gabriel AjustOmatics are standard (export) or optional (domestic) on *nine* different makes of U. S. cars in 1957. Thousands of late-model sports cars, station wagons and other automobiles in use today attest their value. If you are dissatisfied with the conventional controls supplied on your present car, switch over.

Gabriel

AJUSTOMATIC SHOCK ABSORBERS

NEW DISCOVERY!

GLOW-PRINTING

AMAZING NEW HOME-BUSINESS OPPORTUNITY

EARN BIG MONEY

NO PRESS NEEDED—SUPPLIES COST PENNIES

Tremendous opportunity to earn up to $10 per hour in your own home in spare time only. Learn to print signs, banners, posters—anything in amazing RADIANT GLOWING COLORS you can see for miles. Earn up to 300% profit filling orders to meet huge demands in every area. Some earning over $1,000 per month already. No art experience needed.

FREE SAMPLES & HOME-PROFIT DETAILS

Send name and address and we'll rush samples revealing details to you. Don't delay!

SCREEN-PRINT CO. Dept. 19
15127 S. Broadway, Los Angeles 61, Calif.

WORLD'S LOWEST PRICED ADDING MACHINE

Vest Pocket Size FREE TRIAL

$2.95 only

TOTAL COST SEND NO MONEY

COUNTS UP TO 999,999,999
IDEAL FOR BUSINESS AND PERSONAL USE—GUARANTEED ACCURATE.
Not a toy. Operates with only a finger flick. Adds, subtracts, multiplies, divides. Counts up to one billion. Pays for itself over and over. Ideal Gift—for Business, Income Tax and School use. MONEY BACK GUARANTEE. Send name and address. Pay postman only $2.95 plus postage. Beautiful rich-looking Leatherette Case included at no extra cost. Money back in 10 days if not delighted. AGENTS WANTED.

CALCULATOR MACHINE CO., (Mfrs.)
Box 126 Dept. CU-57 Huntingdon Valley, Pa.

RUPTURED

BE *FREE* FROM TRUSS SLAVERY

Now there is a new modern Non-Surgical treatment designed to permanently correct rupture. These Non-Surgical treatments are so certain, that a Lifetime Certificate of Assurance is given.

Write today for our New FREE Book that gives facts that may save you painful and expensive surgery, and tells how non-surgically you may again work, live, play and love and enjoy life in the manner you desire. There is no obligation.

Excelsior Hernia Clinic, Dept. 3705, Excelsior Spgs., Mo.

CABINET MAKING

LOW COST HOME TRAINING COURSE FOR BEGINNERS & ADVANCED CRAFTSMEN

Make money. Learn skills and secrets of fine woodworking and tool use. Professionally prepared shop method training tells and shows how. Covers everything. Easy to master.

Write for free Booklet

INTERSTATE TRAINING SERVICE
DEPT. F-2, PORTLAND 13, OREGON

BECOME A ... Machine Tool DRAFTSMAN & DESIGNER

Mail Coupon For Free Brochure

Simplified home study training program. Learn every phase of Machine Drafting and Tool Designing. Step up to a better job—big-pay. Use spare hours—no interference with present work. Diploma awarded. Low Tuition.

American Technical Society
Dept. PS-957, 850 E. 58th St.
Chicago 37, Ill.

Please send me your FREE BROCHURE and full details about Machine Draftsman and Tool Designer training program.

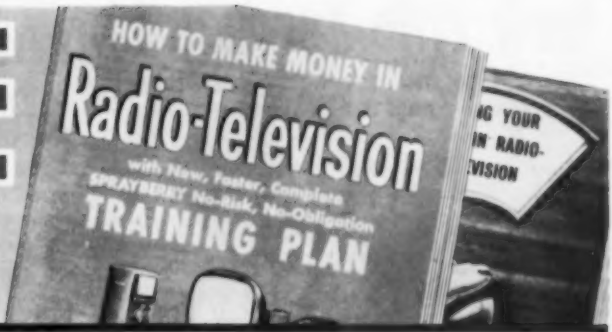
Name .....

Address .....

City ..... State .....

FREE

JUST MAIL COUPON NO SALESMAN WILL CALL ON YOU!

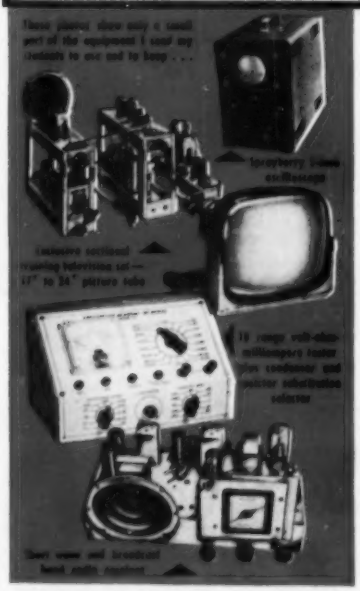


big new catalog and sample lesson prove how

SPRAYBERRY TRAINS YOU BETTER, FASTER, COMPLETELY IN

RADIO–TELEVISION

at home in spare hours—on exclusive NO OBLIGATION plan



AVERAGE COST PER LESSON

Only $3.42

INCLUDING KITS AND EQUIPMENT!

Get Valuable Shop Practice with 25 New Kits of Radio-Television Equipment—YOURS TO KEEP!

Frank L. Sprayberry
Educational Director

If you're ready for training in Radio-Television ..I urge you to mail the coupon below *at once*. I'll send you our big new 56 page FREE CATALOG and interesting FREE SAMPLE LESSON—both FREE! There's no obligation and no salesman will call on you. See how modern, practical Sprayberry Training can prepare you in as little as 10 months to step into a good paying job or your shop as a *Trained* Radio-Television Service Technician. See how I offer you priceless practical experience in circuit testing, trouble shooting and shop practice under the exclusive Sprayberry Plan. You'll build a powerful 2-band superhet-radio, complete television set, 18 range multi-tester, signal generator, signal tracer and many other projects. All this equipment is yours to *keep*...practically everything needed to set up your own Radio-Television Service Shop . . . in Sprayberry Training without one penny of added cost!

Training To Build Your Lifetime Earning Power

Everything you learn in Sprayberry Training you can use to *make money!* This up-to-the-second training includes all the *new* developments...Hi-Fi, Transistors, Color Television, F M...as well as how to service any radio or television set ever built! I have been training men for success in Radio-Television for more than 27 years; and if you can use a screwdriver and like to work with your hands, I can prepare you, too, to take full advantage of almost unlimited opportunities ahead in the world of Radio-Television and Electronics. Enroll without risk! You DO NOT sign a binding time-payment contract. Keep present job . . . earn welcome spare-time money in Radio-Television while training. Mail the coupon get the . . . FREE books and the full facts. Rush today!

MAIL COUPON!

Rush coupon for big catalog, "How to Make Money in Radio-Television" PLUS actual sample Sprayberry lesson —ALL FREE. No obligation! No salesman will call on you. MAIL TODAY!

SPRAYBERRY ACADEMY OF RADIO-TELEVISION
Dept. 55-SA, 1512 Jarvis Avenue, Chicago 26, Ill.

Please rush all information on your All-New Radio-Television Training Plan. I understand this does not obligate me and that no salesman will call upon me. Include New Catalog and Sample Lesson FREE.

Name_____ Age_____

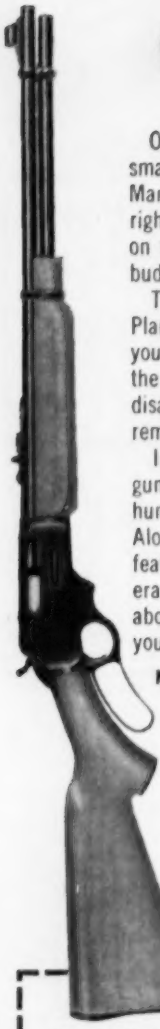
Address_____

City_____ Zone____ State_____

SPRAYBERRY ACADEMY OF RADIO-TELEVISION
1512 Jarvis Avenue • Dept. 55-SA • Chicago 26, Illinois

New rifle for you?

WHY WAIT ANY LONGER TO OWN THAT NEW GUN YOU WANT — WHEN YOU CAN HAVE IT NOW!



Marlin PAY-LATER PLAN

On the Marlin Pay-Later Plan, a small down-payment puts a new Marlin rifle or shotgun in your hands right now, and you pay for it easily on the monthly plan that fits your budget best.

The simple, convenient Marlin Plan is the only one that protects your investment with insurance. In the event of death or 90-day total disability, it automatically makes all remaining payments for you!

In the complete Marlin line is the gun that's perfect for the type of hunting you do—or would like to do. Along with their famous, exclusive features, today's Marlins offer several new ones you'll want to know about. Mail the coupon, and look up your Marlin dealer!

Marlin Model 336 Regular Carbine

30/30 .32 SP. .35 Rem.

Micro-Groove Rifling* improves accuracy by 20-25%

$76.95** Down-payment only **$7.95**

THE NAME FOR GAME

Marlin

FINE GUNS SINCE 1870

*Patent applied for.
**Slightly higher west of the Rockies. Subject to change without notice.

Marlin Firearms Co. H-97
P.O. Box 995, New York 17, N. Y.

Please send me your catalog with photo illustrations and complete descriptions of all Marlin Guns. Also send me the new, illustrated 16 page "Marlin Target and Game Record Book", for my personal shooting records. I enclose 25¢ for handling.

Name.....

Address.....

City.....Zone.....State.....

Want to pass a U.S.

CIVIL SERVICE TEST?

MEN—WOMEN, 18-55. Thousands of positions open. Prepare NOW for next examinations. Write immediately for free 36-page book, with list of many positions and particulars telling how to prepare. Grade school education often sufficient. Veterans get preference.

FRANKLIN INSTITUTE
(Not Government Sponsored)
Dept. L-90, Rochester 4, N. Y.

SLEEPING BAGS GUARANTEED AT FAR LESS THAN WHOLESALE PRICES

$16.47

4 lbs. nylon vermin proof down fill.

★ Guaranteed finest possible quality on money back basis.
★ Own best bag for less than week ends cabin rent.

Send 25c for huge catalog of 6,000 outdoor items at far less than wholesale prices. DEPT. IAFB

HERTER'S • SINCE 1893 • WASECA, MINNESOTA

$150.00-$250.00 Weekly
OPERATING
AUTO RADIATOR SERVICE SHOP

World's largest radiator shop equipment mfgr. will help you set up your own radiator shop — help you get started toward a secure, profitable future. Over 1,000 INLAND shops now operating. First year averages $6,000 to $10,000. Many now making much more. Garage or service station can operate as dept. As little as $305 down for equipment starts you. We will finance balance, furnish complete factory training. Write to

INLAND MFG. CO., Dept. PS-9, 1108 Jackson St., Omaha 2, Nebr.

CASTING SECRETS REVEALED!

Now you can learn how to make big money by casting thousands of perfect planters, book ends, figurines, etc., with X-L rubber molds.

NO EXPERIENCE, VERY LITTLE CAPITAL NEEDED

X-L, Rubber, Pts. $2.50; Qts. $4.00 (postage extra). Molds and enough rubber for three molds, $1.50 prepaid. U.S. only. Send 25c (refunded with order) for informative catalog (40 pages) describing this wonderful, exciting *Profit-making* business.

HUGE PROFITS! MORE MONEY!

PLASTIC ARTS STUDIO 3403 S. MADISON, DEPT. 3 MUNCIE, INDIANA

Make More Money in

AUTO MECHANICS

Learn at home in spare time. Low tuition. All-in-one Shop Method course covers Overhaul, Soup-up, Tune-up, Fuel Injection — ALL OTHER PHASES!! You get everything you need for success in America's BIGGEST Industry. We also give you Motor Analyzing Set; Socket Wrench Set, and complete Tool Set. Write for Information. Send coupon TODAY for FREE BOOK & SAMPLE LESSON. **NATIONAL SCHOOLS**

GET STARTED NOW

National Schools Dept. DC-97
4000 So. Figueroa Los Angeles 37, Calif.
Send Free Auto-Diesel Opportunity Book Today.

Name _____ Age _____
Address _____
City _____ State _____

☐ Check if interested ONLY in Resident School Training at Los Angeles

NOW IT'S EASY TO LEARN

DRAFTING

AT HOME - QUICKLY - IN YOUR SPARE TIME

MECHANICAL AERONAUTICAL

HERE'S YOUR CHANCE! No matter where you live . . . no matter what your present job is, you too can soon be cashing big pay checks and enjoying an assured future in drafting! Never before has there been such a demand for trained draftsmen . . . the key men in all industry. No profession has a brighter future! Draftsmen get top pay . . . are in line for promotion to executive positions.

NO EXPERIENCE NEEDED! The Cleveland Engineering Institute Courses are the most modern, practical, thorough, drafting courses available. They are fully illustrated; prepared especially for Home Study. If you can read this ad, you can learn drafting under C.E.I.'s guidance. Ours is a tested, proven, up-to-date course that has helped thousands of others on the road to success (many of them with only grammar school training.)

EARN WHILE YOU LEARN! Keep your present job while learning drafting at home in your spare time at the speed that is best for YOU. Many students, as they advance, earn extra money by doing part-time drafting. Many graduates earn more in a single week, as draftsmen, than the entire cost of the course.

FREE! AFTER YOU GRADUATE, 50 HOURS OF EXTRA TRAINING AT THE INSTITUTE IN CLEVELAND. This post-graduate training is optional.

WE HELP YOU GET THAT JOB! After you have graduated, C.E.I. will help you find a position. Our Job-Finding-Service is the only one of its kind offered by a Home Study School.

WHAT CAN DRAFTING OFFER YOU? Find out how a C.E.I. DIPLOMA can bring you a better life---more security---the respect of your employer and people in your community. Without obligating yourself in any way, write for the Cleveland Engineering Institute Success Book and a Sample Lesson FREE. Industry needs men of action! This means You. MAIL THE COUPON RIGHT NOW!

You, Too, Can Have:

MORE MONEY
PROFESSIONAL RATING
BIG PAY JOBS
BRIGHT FUTURE
JOB SECURITY
SUCCESS

EARNS $820 MONTH

"My first position after completing C.E.I.'s course jumped my income from $350 up $820 per month."
G. T. Wiseman, Tennessee

NOW FOREMAN

"Shortly after completing the C.E.I. course I was made Shop Foreman with a 50 per cent increase in salary."
Wm. Reichers, New York

BIG PROMOTION

"I was promoted from the production line ahead of four other men and got a good pay increase after finishing the C.E.I. course."
W. K. Andersen, Wisc.

GOOD START

"The drafting job which I got with your assistance is going very good. The C.E.I. Mechanical Drafting Course has given me a real start."
R. Eisenbart, Wisc.

BIG FUTURE

"I have been transferred to the Mech. Eng. dept. as a Mechanical Engr. Trainee. C.E.I. has given me a big push towards future success."
R. Hodge, Netherlands Indies

VETERAN APPROVED

COMPLETE PROFESSIONAL EQUIPMENT. At no extra cost C.E.I. will supply you with everything you need—including a slide rule, tools and imported, quality drafting set. Drawing pencils, paper, everything is furnished! There is nothing else to buy!

FREE LESSON AND SUCCESS BOOK

SAMPLE LESSON

SUCCESS BOOK

CLEVELAND ENGINEERING INSTITUTE
ENGINEERING DRAFTING EXCLUSIVELY

MAIL COUPON NOW!

CLEVELAND ENGINEERING INST., Dept. PS-9G
6300 Euclid Ave. Cleveland 3, Ohio

Please RUSH my Free Success Book and Sample Drafting Lesson in
☐ Aeronautical
☐ Mechanical

My Name ..... Age ...
Address .....
City ..... Zone .... State .....
(No Obligation—No Salesman Will Call)

REFRIGERATION
AIR CONDITIONING
INFORMATION IN A HANDY FORM

ASK TO SEE IT!

Every Serviceman, Mechanic & Operator can use AUDELS REFRIGERATION & AIR CONDITIONING GUIDE, containing Practical, Inside Trade Information on the whole subject of Refrigeration & Air Conditioning. Tells How to Service, Operate & Repair Modern Household, Commercial & Industrial Units & Air Conditioning Systems. 1360 Pages, 46 Chapters Fully Illustrated & Indexed for Quick Reference.

1001 FACTS

This big, highly indorsed book, easy to understand, gives useful basic principles on How to Repair & Install Compressors, Control Devices. How to locate Electric Motor Troubles. How to Service & Adjust Cold Storage Lockers, Quick Freezing Units, Dairy & Market Refrigerators, Ice Cream & Soda Fountains, How to Maintain Water Coolers, Marine Refrigeration, Plant Auxiliaries, Ice Making, Ammonia Plants, Brine Systems, Servicing Air Conditioning Systems, Replacement of Refrigerants including Freons, Heat Transmission & Pressure Temperature Charts, Tables, Duct Systems, Safety Codes, etc.

$6 ANSWERS YOUR QUESTIONS

Get this Information for Yourself. Mail Coupon today.
COMPLETE • PAY ONLY $2 A MONTH ←

Every Mechanic can Step Up his Skill with AUDELS GUIDES. Containing Practical Inside Information in a Handy Form. Covers facts and figures of your Trade. All illustrated and explained. Books sent to you for **7 DAYS FREE EXAMINATION.** Send No Money Nothing to Pay Postman. Check Books Wanted—Mail Today.

MAIL ORDER

AUDEL, *Publishers,* **49 W. 23 St., New York 10, N.Y.**

Please send me for FREE EXAMINATION books marked (x) below. If I decide to keep them I agree to mail $2 in 7 Days on each book or set ordered and further mail $2 monthly on each book or set until I have paid price plus shipping charges. Otherwise, I will return them.

[X]

Check NOW!

You Can Look Over Any Guide In Your Own Home

Start the Easy Payments If Satisfied

MAIL THIS TODAY

- [ ] HOME APPLIANCE SERVICE GUIDE, 864 Pages $6
- [ ] AUTOMOBILE MECHANICS GUIDE, 1696 Pages 6
- [ ] TRUCK & TRACTOR GUIDE, 1376 Pages 5
- [ ] DIESEL ENGINE MANUAL, 640 Pages 3
- [ ] MACHINISTS HANDY BOOK, 1728 Pages 6
- [ ] WELDERS GUIDE, 608 Pages 3
- [ ] BLUE PRINT READING, 448 Pages 2
- [ ] MATHEMATICS & CALCULATIONS, 752 Pages 2
- [ ] SHEET METAL PATTERN LAYOUTS, 1152 Pgs. 7.50
- [ ] SHEET METAL WORKERS HANDY BOOK, 448 Pgs. 2
- [ ] MECHANICAL DRAWING GUIDE, 192 Pages 2
- [ ] MECHANICAL DRAWING & DESIGN, 480 Pages 3
- [ ] TELEVISION SERVICE MANUAL, 480 Pages 3
- [ ] RADIOMANS GUIDE, 1088 Pages 5
- [ ] ELECTRONIC DEVICES, 304 Pages 3
- [ ] ELECTRIC MOTOR GUIDE, 1056 Pages 5
- [ ] WIRING DIAGRAMS (Light & Power), 304 Pgs. 2
- [ ] ELECTRICIANS EXAMINATIONS, 272 Pages 2
- [ ] ELECTRIC POWER CALCULATIONS, 480 Pages 3
- [ ] HANDY BOOK OF ELECTRICITY, 1520 Pages 5
- [ ] ELECTRIC DICTIONARY, 9000 Terms 3
- [ ] ELECTRIC LIBRARY, 7000 Pages (10 Book Set) 20
- [ ] REFRIGERATION & Air Conditioning, 1360 Pgs. 6
- [ ] MILLWRIGHTS & MECHANICS GUIDE, 1248 Pgs. 5
- [ ] POWER PLANT ENGINEERS GUIDE, 1568 Pages 5
- [ ] ENGINEERS & FIREMANS EXAMS, 544 Pages 2
- [ ] PUMPS, Hydraulic & Air Compressor, 1760 Pgs. 6
- [ ] OPERATING ENGINEERS LIBRARY (3 Books) 12
- [ ] GARDENERS & GROWERS GUIDES (4 Book Set) 6
- [ ] CARPENTERS & BUILDERS GUIDES (4 Book Set) 8
- [ ] PLUMBERS & Steamfitters Guides (4 Book Set) 8
- [ ] MASONS AND BUILDERS GUIDES (4 Book Set) 8
- [ ] PAINTERS & DECORATORS MANUAL, 464 Pgs. 2
- [ ] HOUSE HEATING GUIDE, 1008 Pages 5
- [ ] OIL BURNER GUIDE, 416 Pages 2

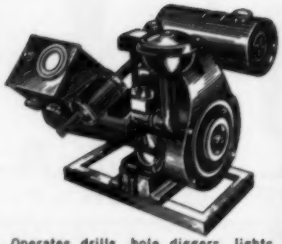
Name _____

Address _____

Occupation _____

Employed by _____ 99

[ ] **SAVE SHIPPING CHARGES! Enclose Full Payment With Coupon and We Pay Shipping Charges.**



AIR FORCE SURPLUS!

Portable D.C. Power Plant

3000-watt, 115-volt, 28-amp.

Cost Govt. $435
While supply lasts . . .
ONLY **$195**
F.O.B. Pasadena

Operates drills, hole diggers, lights, stoves, power saws, etc. Ideal for farmers, ranchers, contractors, marine companies, campers, sportsmen, utility companies. Runs any DC or AC-DC motor up to 2 hp. Has voltmeter, field rheostat, outlets, overload protection. No C.O.D.'s please. Remit full amount of purchase with order.

C & H SALES CO.
2176 E. Colorado St. • RYan 1-7393
Pasadena 8, Calif.

More Comfort Wearing
FALSE TEETH

Here is a pleasant way to overcome loose plate discomfort. FASTEETH, an improved powder, sprinkled on upper and lower plates holds them firmer so that they feel more comfortable. No gummy, gooey, pasty taste or feeling. It's **alkaline** (non-acid). Does not sour. Checks "plate odor" (denture breath). Get FASTEETH today at any drug counter.

SHORTHAND IN 6 WEEKS

Famous SPEEDWRITING shorthand. 120 words per minute. No symbols; no machines; uses ABC's. Easiest to learn, write and transcribe. Low cost. 350,000 graduates. For business and Civil Service. Typing available. 34th Year. Schools in over 400 cities. Write for FREE booklet to:

Speedwriting®
Dept. 2609-7
55 W. 42 St., N.Y., 36, N.Y.

IT'S EASY . . .
MAKE MONEY IN PHOTOGRAPHY

If you are over 17—good pay and fascinating work await you in photography! Start making money quickly in spare-time—step into your own studio or exciting career job. LEARN-BY-DOING method trains you at home! Write TODAY for FREE catalog. Also Resident Training. Co-ed. 47th Year. Approved for Veterans.

NEW YORK INSTITUTE OF PHOTOGRAPHY
10 West 33 Street New York 1, New York
Dept. 5 **47th YEAR**

High School at Home

MANY FINISH IN 2 YEARS

No classes. No time wasted going to and from school. Progress as fast as your time and abilities permit. Standard H. S. texts supplied. Thousands enroll each year in this 60-year-old school. Send for FREE descriptive booklet.

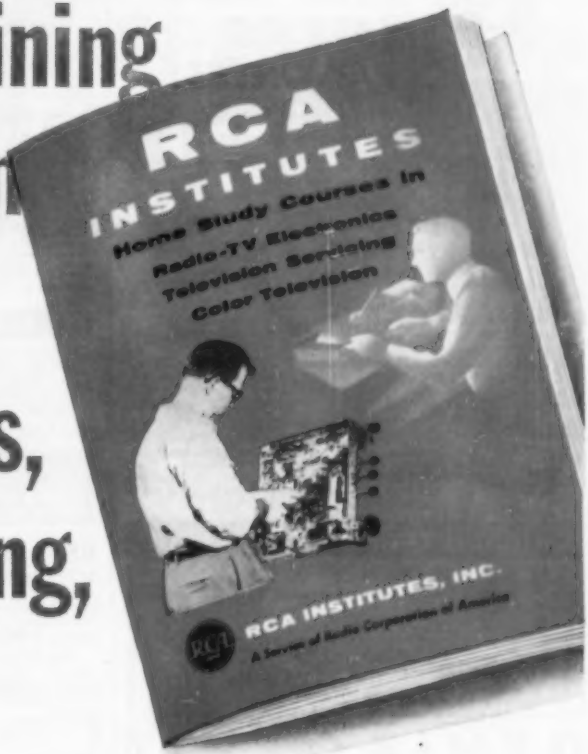
AMERICAN SCHOOL, Dept. H646
Drexel at 58th St., Chicago 37, Ill.
Without obligation, please send FREE descriptive booklet.

Name .....

Address .....

Complete Canadian Courses available. Write American School, Dept. H646, 6083 Sherbrooke St. W., Montreal

RCA offers you the finest training at home in Radio–TV electronics, TV servicing, Color TV



SEND FOR THIS FREE BOOK NOW!

Pay-as-you-learn. You need pay for only one study group at a time. Practical work with very first lesson. All text material and equipment is yours to keep. Courses for the beginner and advanced student.

RCA INSTITUTES, INC.

A SERVICE OF RADIO CORPORATION of AMERICA
350 WEST FOURTH STREET, NEW YORK 14, N.Y.

In Canada—RCA Victor Company, Ltd.
5001 Cote de Liesse Rd., Montreal 9, Que.

RCA Institutes, Inc., Home Study Dept. PS-97
350 West Fourth Street, New York 14, N. Y.

Without obligation, send me FREE 52 page CATALOG on Home Study Courses in Radio, Television and Color TV. No Salesman will call.

Name.....
Please Print

Address.....

City.....Zone.....State.....

KOREAN VETS! Enter discharge date.....

To save time, paste coupon on postcard

DRAFTSMEN

CASH BIG PAY CHECKS!

Train Now for more success, greater security

LEARN AT HOME IN SPARE TIME
(or at college in Chicago)

Check the want ads in any newspaper—SEE the big-pay opportunities open to you as a draftsman. What's more, you can learn this well-paid, prestige profession at home—quickly, easily! No special talent needed! Get complete, step-by-step Chicago Tech lessons in the mail, spend a few pleasant hours studying each week. In a short time you'll be a well-trained draftsman, ready to take your pick of many good jobs. Act now!

FREE INFORMATION—MAIL COUPON TODAY!
Get FREE TRIAL LESSON plus information about C.T.C. practical training. Learn what successful Chicago Tech graduates say about high pay and opportunities in drafting. No charge, or obligation.

CHICAGO TECHNICAL COLLEGE

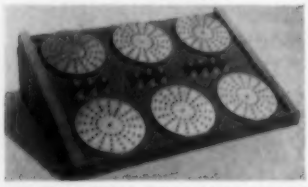
M-225 Tech. Bldg., 2000 So. Michigan Ave.
Chicago 16, Illinois
Mail me FREE Lesson with information about big opportunities in DRAFTING.

Name ..... Age .....
Address .....
City ..... Zone .... State .....

GENIAC® KIT

Makes 34 Different

Computing Machines



This world famous kit, over 10,000 sold to schools, colleges, business firms and electronically minded people like yourself, has proven itself as best and only way to learn about computers with simple easy to read manuals and parts you can put together yourself.

No Soldering—you put the machines together and take them apart with solderless connections. Quick rewiring from wiring diagrams gives you an easy method of progressing from simple to complex with interesting illustrated manuals, and a 200-page book—Machines and the Mind—which discusses cybernetics, advanced computers, how the human mind functions as a computer.

Some of the machines you construct —adding, subtracting, multiplying and dividing machines, code analyzing and decoding machines, syllogism solvers, binary to decimal converters, game playing machines (can you beat the machine at Tik-tac-toe and Nim) and among the dozen of others a machine that composes musical tunes. Send for your GENIAC® now and have fun while you learn to build computers.

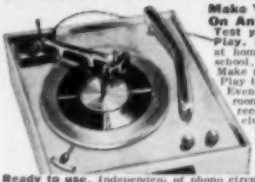
Every kit comes complete with over 400 parts, components, texts, manuals and accessories.

Return Guarantee—If you use the Geniac for 10 days and return it in good condition we will immediately refund your money.

The complete Geniac® Kit with tools, components, texts, parts for constructing 34 different calculating, reasoning, game playing and puzzle solving machines, **only $19.95 postpaid** (add 80c W. of Miss., $2.00 Outside U.S.). Send check or money order to

Dept. PS-97, OLIVER GARFIELD CO., INC. 126 Lexington Ave. New York 16, N.Y.

Electronic Recorder ONLY $14.95



Make Your Own Records On Any Phonograph. Test your voice. Talk. Sing. Play. Immediate playback. Fun at home. Practical for office & school. Send records to friends. Make records from radio or TV. Play back favorites years later. Even conceal mike in another room! Makes 33, 45 or 78 rpm records (any speed). Set includes: **Recording Unit** (arm & electro-magnetic cutting stylus) which operates on any turntable, **electric Studio Microphone, cutting needles & blank records. No wiring.**

Ready to use. Independent of phono circuit. Guaranteed.
Complete Set Postpaid Only **$14.95**
(Package of 5 Blank Record Discs $1.98)

Johnson Smith Co. Dept. 577 Detroit 7, Mich.

Catalog OF 3200 Novelties 10c

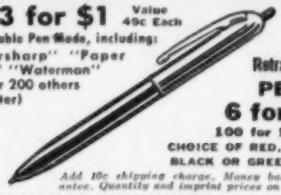
Send 10c for amazing catalog of novelties, live animals, scientific supplies, hobbies, funmakers, planes & boats, looms, magic tricks, joke articles, unusual seeds, gadget timesavers, cameras, optical goods, projectors, movies, lucky jewelry, religious novelties, disguises, musical instruments, stamps, coins, puzzles, fortune tellers, radios, auto & bike accessories, telescopes, magnifiers, compasses, banks, smokers' gadgets, artists' supplies, printing sets, engines, motors, shockers, knives, billfolds, fireworks, guns, rifles, sports, books, games, plants, etc. Send name, address & 10c to:
JOHNSON SMITH & CO., Dept. 577 Detroit 7, Michigan

EYE GLASSES *by* MAIL As low as $1.95

WRITE for FREE CATALOG with 14 LENS SAMPLE CARD
Thousands of Customers
Est. 1939

QUALITY READING-MAGNIFYING OR BIFOCAL GLASSES FOR FAR AND NEAR
ADVANCE SPECTACLE COMPANY, Inc.
537 S. Dearborn St., Dept. SP-9 Chicago 5, Illinois

REFILLS 13 for $1 Value 49c Each
To Fit Every Retractable Pen Made, including:
"Scripto" "Eversharp" "Paper Mate" "Sheaffer" "Waterman" "Wearever." Over 200 others (except Parker Jotter)
One make per $1 order.
Choice of Red, Blue, Black, Green or Brown Ink.



($1.79 Value Each)
Retractable
PENS
6 for $1
100 for $16.50
CHOICE OF RED, BLUE, BLACK OR GREEN INK!

Add 10c shipping charge. Money back guarantee. Quantity and imprint prices on request.

BARCLAY DISTRIBUTORS
Dept. 3 86-24 Parsons Blvd. Jamaica, N. Y.

HYPNOTISM

Be Popular Amaze Entertain

Learn to apply Hypnotism and Autosuggestion in short time by training at home. Write to America's oldest, most famous Hypnotic School for free information—now—today. DON'T DELAY. Satisfaction or money refunded. Sent in plain wrapper.

SCHOOL OF APPLIED HYPNOLOGY
Dept. 29 120 Central Park South N. Y. 19, N. Y.

BUY BELOW WHOLESALE

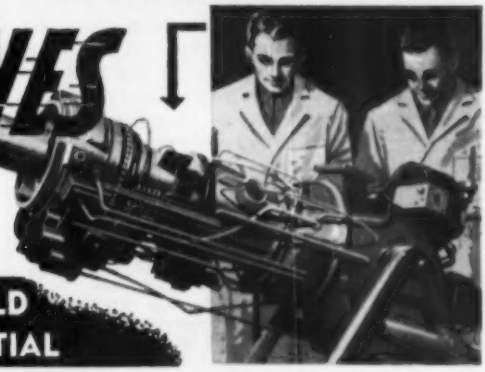
START YOUR OWN HOME-IMPORT BUSINESS

Make big profits on thousands of exotic imports. No experience or investment in products needed. Famous world trader guides men and women—shows you how to pocket profits before ordering, **how to get free ads**, how to start full or spare time home mail-order business or take volume orders from stores. Export opportunities also. Full details, booklet and list of 157 imports showing amazing low foreign prices—**ALL FREE.** Air mail reaches us overnight. Write

MELLINGER CO., Dept. G249
1717 Westwood, Los Angeles 24, Calif.

MEN FOR IMMEDIATE TRAINING AS JET ENGINE SPECIALISTS

JET ENGINES



GAS TURBINE ENGINES
FUEL INJECTION SYSTEMS

MEN, AGES 17 to 55

NEWEST LABOR-SHORT FIELD —GREAT EARNINGS POTENTIAL

EXPERIENCE UNNECESSARY

The engine power of the future is here TODAY! Aircraft and other industries are being revolutionized by jet engines, gas turbine engines and fuel injection systems! Help is needed NOW! Tremendous opportunities for you if in on ground floor. Large "HELP WANTED" advertisements in leading newspapers tell the story: a serious shortage of trained qualified help. Here's your chance to get into the Jet Industry while it's in its infancy!

TOP CALIBER POSITIONS with EXCEPTIONAL BENEFITS

Aircraft and other industry employment represents maximum benefits to employees: automatic pay increases, paid holidays, vacations with pay, group hospitalization, surgery and life insurance, pensions, cost of living allowances, recreational facilities, exceptional housing and shopping facilities, and other important advantages.

ADVANCEMENT RAPID ...DESK or SHOP JOBS

The jet age is in its infancy. Men with earliest training have first opportunity to advance to top supervisory and executive positions. Many different types of skills and men required. Many different types of work offering opportunities for travel.

HELP GIVEN IN FINANCING TRAINING

by arranging terms. You will be assisted in making rapid and successful progress. The need for men is great. Delays will be costly. JET ... GAS TURBINE ... and FUEL INJECTION SYSTEMS TRAINED MEN stand at the threshold of the greatest technical revolution since the development of the gasoline engine. Mail coupon, card or letter today.

TREMENDOUS OPPORTUNITIES FOR TRAINED QUALIFIED MEN!

OFFICE JOBS AS WELL AS FACTORY JOBS

Starting salaries range from $80.00 to $117.00 for 40-hour week. No previous Jet Engine experience required. We train you completely for the job of your choice.

RUSH AT ONCE for INFORMATION WITHOUT OBLIGATION

JET ENGINE DIVISION, NORTHWEST SCHOOLS
Hollywood — Chicago — Portland
Dept. J-1, 1221 N. W. 21st, Portland, Oregon

I wish full information without obligation about Jet and Gas Turbine Engine Training Program.

Name_____

Address_____

_____ Age_____

____Hours I work _____ Education _____ Phone

INVENTORS

WE recommend that you take the following preliminary steps toward patent protection. Make a disclosure of your invention; sign, date and have your disclosure witnessed by two people who understand your invention; authorize us to conduct a preliminary search among previously granted U. S. patents for similar types of invention. We give you a report on the probable patentability of your invention and our recommendation for further course of action.

Let us send you a copy of our instructive booklet, "Patent Protection for Inventors" and our convenient "Evidence of Invention" disclosure form. No obligation.

VICTOR J. EVANS & Co. *Merlin M. Evans*
REGISTERED PATENT ATTORNEY
340-K MERLIN BUILDING, WASHINGTON 6, D. C.

INVENTORS

PROTECT YOUR INVENTION BY A U. S. PATENT. SEND FOR FREE "INVENTION RECORD" FORM AND "PATENT INFORMATION EVERY INVENTOR SHOULD HAVE".

CARL MILLER
REGISTERED PATENT ATTORNEY
WOOLWORTH BLDG., 36th FLOOR, 97C
NEW YORK CITY

INVENTORS

U. S. Patents protect your inventions. Our free book of "Instructions on Patent Procedure for Inventors," also "Certificate of Invention" form sent without obligation.

C. A. SNOW & CO.
REGISTERED PATENT ATTORNEYS
426 SNOW BUILDING WASHINGTON 1, D. C.

INVENTORS

Whether an invention is patentable can be substantially determined by a search of the U. S. Patent records. Without obligation, write for information explaining the steps you should take to secure a patent.

JOHN N. RANDOLPH
Registered Patent Attorney
205 Columbian Building Washington 1, D. C.

INVENTORS

I shall be pleased to furnish you, upon request, with information relative to patent procedure—without any obligation on your part.

PATRICK D. BEAVERS
Registered Patent Attorney
937 Columbian Building, Washington 1, D. C.

INVENTORS

Send for PATENT INFORMATION Book and INVENTOR'S RECORD without obligation

GUSTAVE MILLER
97PS WARNER BUILDING
WASHINGTON 4, D.C.

REGISTERED PATENT ATTORNEY
ASSOCIATE EXAMINER
U.S. PAT. OFF. 1922-1929
Patent Attorney & Advisor
U. S. NAVY DEPT. 1930-1947
PATENT LAWYER

When Writing to Advertisers Please Mention Popular Science

KEEP YOUR... on BENJAMIN "First in POWER and ACCURACY"
for HIGH H C COMP
AIR GUNS & CO_2 GAS GUNS—Top Quality at LOWEST PRICES!

BB Benjamin Super CO_2 Rocket Gas Pistol with 2-Stage HI-LO Jet Power as low as **$13.50**

BB or 177 or 22

Benjamin Air Rifles and Benjamin Air Pistols are Recognized All Over the World for Finest Workmanship and Highest Quality at Lowest Prices. Adjustable Power with Amazing Optimum Force. Fully Guaranteed—Safe—Accurate—Economical. Easy to Use anywhere—12 Models for Target and Small Game—BB or 177 or 22.

All Models Benjamin CO_2 Carbine Gas Rifles and Benjamin CO_2 Rocket Gas Pistols Use Standard Size CO_2 Cartridges (available everywhere). 2-Stage HI-LO Jet Power—High for Small Game—Low for Target—Up to 50 Shots from each Cartridge. No Pumping—Safe—Accurate—Economical—Non Toxic—12 Models BB or 177 or 22.

FREE! Catalog All Models Benjamin Air Guns & CO_2 Guns & Supplies. Also, Money-Saving Offer on Hunting & Fishing Accessories.

Send Free Gun Catalog and Special Offer!

BENJAMIN AIR RIFLE CO., MAIL TODAY!
852 BARRY ST., ST. LOUIS 4, MO., U.S.A.
Name _____
Address _____
City _____ State _____

INVENTIONS For Sale

Our clients have excellent inventions in many fields to be manufactured and marketed on a cash, royalty or license basis. Full description of clients' inventions will be sent if you state your field of interest. INVENTORS: WE ALSO WANT INVENTIONS OF EVERY TYPE. Write for details.

GLOBAL MARKETING SERVICE
2420 77th Ave. Dept. PS Oakland 5, Calif.

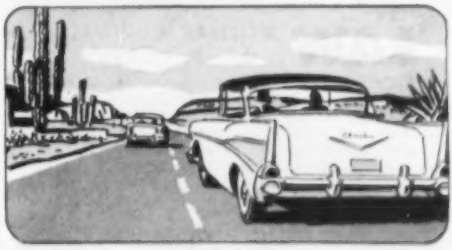
INVENTORS NEEDED AT ONCE

If you have an invention you wish to sell outright or license on royalty, write us at once. We are seeking inventions of household items, games, toys, sports items, tools, and mechanical and technical devices. Patented or unpatented. For further information and free brochure outlining manufacturers' requirements, royalty rates, send name (no drawings, please) on letter or postcard at once.

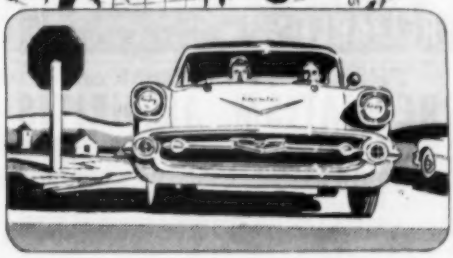
KESSLER CORPORATION, Dept. 79-D, Fremont, Ohio

"You have more to say about gas mileage than you think!"

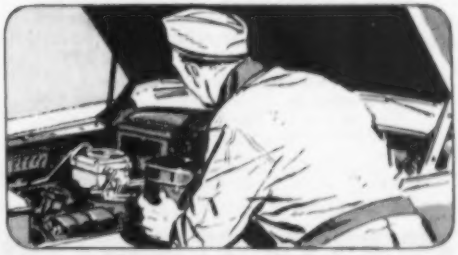
Maurice Rose. One of America's top professional drivers for over 25 years, three-time Indianapolis 500-mile winner.



"Speed plays an important part in your car's gas consumption. Stock cars are built for peak efficiency at cruising speed, not top speed. Speeders not only take unnecessary chances, but also waste gas."



"A pro knows it doesn't pay to race away from stops. Accelerating hard in low gears eats holes in gas mileage. And it's not worth the wear on your engine . . . you get there just as soon taking it easy."



"And to be sure you have the final say on gas mileage, have your carburetor and other vital engine parts checked regularly by a factory-trained mechanic. Don't wait until your car starts to act up!"

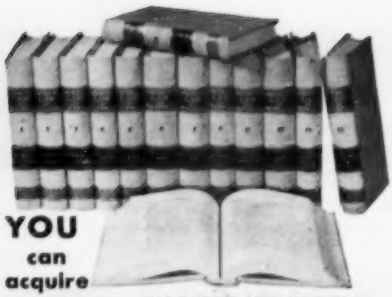
When tune-up time rolls around for your car, be sure to see a Rochester Carburetor specialist. He is thoroughly trained in all phases of carburetion by GM and UMS experts. He'll give your car the kind of care that only a factory-trained mechanic can. When it comes to long life and dependable service, he knows that Rochester Carburetors are second to none. They're precision-built for top performance on high-compression engines. And Rochester Carburetors deliver *just* the right mixture, at *just* the right time, to squeeze extra mileage out of every gallon of gas.

Standard equipment on Cadillac, Buick, Oldsmobile, Pontiac and Chevrolet.

ROCHESTER CARBURETORS

GM PARTS SALES

ROCHESTER PRODUCTS DIVISION OF GENERAL MOTORS CORPORATION, ROCHESTER, N.Y.



YOU can acquire

LAW NIGHTS AT HOME! LL.B. DEGREE

LaSalle's famous Law Library—used as reference in many Law libraries and Law offices—has enabled thousands to master Law surprisingly fast, in spare hours at home, for business and professional advancement.

These 14 remarkable volumes, compiled by leading professors and lawyers, cover the whole basic field of Law in condensed, orderly, simplified manner.

You advance rapidly with this great library, plus special lectures furnished. We guide you step-by-step with personalized Problem Method of instruction . . . you *learn by doing*—handling legal problems—not by memorizing rules.

Send for two FREE booklets, "Law Training for Leadership," and "Evidence," answering questions about Law and its value to you, and telling how LaSalle Law graduates are winning rapid advancement in business and public life. Mail coupon below. No obligation.

LA SALLE EXTENSION UNIVERSITY
A Correspondence Institution
417 S. Dearborn St. Dept. 983-L Chicago 5, Ill.

Send me your two FREE booklets described above, without obligation.

Name.....*Age*.....

Street.....

City, Zone & State.....

BIG PAY JOBS for men who qualify in DIESEL

TRAIN NOW FOR A DIESEL FUTURE. Steady, high-pay jobs await men qualified in Diesel, Tractor, and Heavy Equipment. Are you qualified for job and advancement opportunities in this fast-growing field? You can qualify!

COMPLETE DIESEL COURSE NOW AVAILABLE. If you are ambitious and want to get ahead in this big money field, you'll want to know about the complete Diesel home training course now offered by Interstate Training Service. Covers all phases of operation, repair, service. Easy to master in spare time. No interference with present job. Up-to-the-minute. Regularly revised to cover new developments. We invite comparison of material offered. Advisory placement service for our students.

YOU OWE IT TO YOURSELF to investigate Interstate Training Service Diesel Training. Thousands agree it has helped them to better jobs...better pay It can do the same for you!

WRITE FOR FREE INFORMATION TODAY

INTERSTATE TRAINING SERVICE, Portland 13, Ore.
Please see that I receive FREE 24-page book, "Getting Ahead in Diesel." (A-2)

NAME_____ AGE_____
ADDRESS_____
CITY_____ ZONE_____ STATE_____

ACCORDION PRICES SMASHED

SAVE 50% AND MORE DURING THIS GREAT SALE

5 Days' FREE TRIAL

Hurry! Get in on these sensational accordion values. America's largest exclusive accordion dealer selling out finest brand new accordion overstock! Fabulous savings. Leading brands in more than 30 new models. Small down payment. Easy terms. Trade-ins accepted. Chance of a lifetime.

FREE for promptness . . .
- FREE Lessons
- Music Stand
- Deluxe Case
- Lifetime Guarantee

FREE COLOR CATALOG & Wholesale Prices

Learn how easily you may own and play a fine accordion. Rush name and address for big FREE Color Catalog and new low wholesale price list. No obligation. WRITE TODAY!

ACCORDION MANUFACTURERS AND WHOLESALERS OUTLET
2003 W. CHICAGO AVE., Dept. P-97, CHICAGO 22, ILLINOIS

B.F.Goodrich • Firestone

TIRE SALE

AT LESS THAN WHOLESALE!

SAVINGS NEVER LESS THAN 50% UP TO 70% OFF REGULAR PRICES
➡ SEND FOR YOUR FREE CATALOG! ⬅

RELIABLE TIRE CO. • 730 MORGAN BLVD. CAMDEN 4, N. J.

FREE—Amazing Book on

RHEUMATISM, ARTHRITIS

If you suffer aches, pains and discomforts of Rheumatism, as manifested in ARTHRITIS, NEURITIS, SCIATICA or LUMBAGO, send today for this FREE Book. It reveals important facts about why drugs and medicine give only temporary relief without removing cause. Explains a proven, specialized system of treatment that may save you years of distress. No obligation. Write for this FREE Book today!

BALL CLINIC, DEPT. 36, EXCELSIOR SPRINGS, MO.

make your own *Gems* 32.50 up

The Gem Maker comes complete with all necessary equipment, including a super-charged diamond blade for sawing, and all wheels for grinding, shaping and polishing; also complete instructions. The complete equipment as shown and motor and belt, for only $32.50, f.o.b., Burlington, Wisconsin. Write today for information and literature.

B & I MANUFACTURING CO.
Dept.S Burlington, Wis.

Better Than Your Own

SHOE STORE AT HOME

No investment, no experience needed. Just show magic cushion comfort to friends, neighbors, co-workers. Advance commissions to $4.00 a pair, plus Cash Bonus, Paid Vacation, $25.00 Reward Offer. Outstanding values for men, women, children. Money back guarantee. Shoe samples supplied without cost. Write TODAY for FREE new 84 page catalog and full details.

Two-Eyelet Hit With Cushioned Comfort

TANNERS SHOE CO., 523 BROCKTON, MASS.

Do You Laugh Your Greatest Powers Away?

THOSE STRANGE INNER URGES

You have heard the phrase, "Laugh, clown, laugh." Well, that fits me perfectly. I'd fret, worry and try to reason my way out of difficulties — all to no avail; then I'd have a hunch, a something within that would tell me to do a certain thing. I'd laugh it off with a shrug. I knew too much, I thought, to heed these impressions. Well, it's different now—I've learned to use this inner power and I no longer make the mistakes I did, because I do the right thing at the right time.

This FREE BOOK Will Prove What Your Mind Can Do!

Here is how I got started right. I had heard about hypnosis revealing past lives. I began to think there must be some inner intelligence with which we were born. In fact, I often heard it said there was; but how could I use it, how could I make it work for me daily? That was my problem. I wanted to learn to direct this inner voice, master it if I could. Finally, I wrote to the Rosicrucians, a world-wide fraternity of progressive men and women, who offered to send me, without obligation, a free book entitled *The Mastery of Life*.

That book opened a new world to me. I advise *you* to write today and ask for your copy. *It will prove to you* what your mind can demonstrate. Don't go through life laughing your mental powers away. Use the coupon below or write: Scribe E.G.A.

USE THIS GIFT COUPON

SCRIBE E.G.A.
The Rosicrucians (AMORC)
San Jose, California

Please send free copy of *The Mastery of Life*, which I shall read as directed.

Name .....

Address .....

City ..... State .....

The ROSICRUCIANS (AMORC) San Jose, Calif. (Not a religious organization)

DOUBLE PROTECTION!

Switch to a
Filter Pipe by MEDICO

Protects you from irritants
Safeguards your pleasure

Nicotine, tars, flakes and juices trapped inside Medico's changeable filter never reach your mouth. When filter is discolored, replace with fresh one. That's why Medico is more enjoyable than any other smoke — *Cleaner . . . Milder Cooler . . . Sweeter*

NEW! 1958 series of
MEDICO Crest
Gold Crest Pipe $5.00
Crest Pipe 3.50
Other Medico Filter Pipes $1.50 to $30.00

MEDICO
Trademark
FILTER PIPES
For Catalog X-1, write MEDICO, 18 E 54th St. N. Y. 22

FREEZER TIPS...

TO PROTECT frosting on decorated cakes, first freeze cake unwrapped. Then remove cake from freezer, wrap and seal tight with "SCOTCH" Brand Freezer Tape. Write label right on the tape itself! Moisture-resistant tape seals, holds fast in sub-zero cold to foil, film, paper, Saran or other wraps. Get "SCOTCH" Freezer Tape now, 35¢ or 98¢ in cutter-edge carton. ©1957, Minnesota Mining & Mfg. Co., St. Paul 6, Minn.

NEW MAGIC RADIO WALKIE TALKIE!

YOUR OWN POCKET SIZE RADIO STATION!

BROADCASTS TO ANY HOME OR CAR RADIO WITHOUT WIRES OR HOOKUPS! Wt. only 8 oz. Size (1¼x2½x4½". Built-in telescoping antenna. Powerful Transistor—sensitive microphone, frequency setter, break-in switch! Runs for weeks on self-contained flashlight batteries. Durable plastic case. With this Radio Talkie you CAN TALK TO YOUR FRIENDS UP TO A BLOCK OR MORE AWAY! Talk up to 1 mile or more between two automobiles. INSTANT OPERATION! Just push button to talk! No license needed. Uses inductive field magnetic radiation. Useful and real fun in a million ways! GUARANTEED TO WORK. 1 YEAR SERVICE GUARANTEE.

SEND ONLY $2.00. (cash, ck, mo) and pay postman $9.99 (COD postage or send $11.98 for prepaid delivery. COMPLETE READY TO OPERATE with instructions and hundreds of ways and tricks for broadcasts thru any radio you desire. Price may go up soon, so get your NEW POWERFUL RADIO-WALKIE TALKIE NOW. Available only from: **WESTERN RADIO, Dept. RPS-9, KEARNEY, NEBR.**

3" REFLECTING TELESCOPE

FAMOUS MT. PALOMAR TYPE

60 & 120 Power—An Unusual Buy!

Assembled—ready to use! You'll see the Rings of Saturn, fascinating planet Mars, huge craters on Moon, Star Clusters, Moons of Jupiter. Aluminized and overcoated 3" diameter high-speed f/10 mirror. Optical Finder included. Sturdy, hardwood, portable tripod. Order by Stock No.—Send check or M.O.—Money-back guarantee!

FREE: star chart plus 37¢ astronomy book Stock No. 85,050 N. **$29.50** f.o.b.

Write for FREE catalog N Barrington, N.J.

EDMUND SCIENTIFIC CO., Barrington, N. J., U. S. A.

BUILD A BOAT AT 1/3 THE COST!

with **CLEVELAND'S** full size, cut-to-shape boat patterns, detailed blueprints, and specifications. All classes and styles of modern Naval Architect-designed boats from 7½ to 38 ft. **BIG NEW 86-PAGE ILLUSTRATED CATALOG,** 50c (coin). "How to Build a Boat" Booklet, $2.50. **Hardware & Equipment Catalog, $1.50.**

CLEVELAND BOAT BLUEPRINT CO.

Dept. A-177 Box 1651 Cleveland, Ohio

$AVE $ ON U$ GOV'T $URPLU$

Our publication "Government Surplus Sales" lists hundreds of items for sale by the U. S. Government at tremendous savings, as low as 1c on a $1.00.

These are samples of the savings that are being made:

LIFE BOAT	**$12.00**	**GRINDER**	**$4.69**	**SHAPER**	**$15.00**	**DUMP TRUCK**	**$76.77**
TRACTOR	**$75.00**	**TYPEWRITER**	**$7.51**	**FREEZER**	**$50.00**	**SPRAY PAINTER**	**$15.25**
				MOTOR	**$4.00**		

Hundreds others listed in our bulletin "Government Surplus Sales" and may be purchased direct from U. S. Government. Hunting, Fishing, Camping, Sporting Equipment, Photographic Equipment and Supplies, Radio and Electronic Equipment, Amphibious Trucks, Jeeps, Boats, Motors, Binoculars, Plumbing, Electrical Equip., Cars, Power Tools, Machinery, Chemicals, Furniture, Office Equipment, Supplies, Scrap, Etc.

How may you receive our bulletin "Government Surplus Sales?" By sending $1.00 to

GOVERNMENT SURPLUS SALES, P. O. Box 169, Department 4-3, East Hartford 8, Conn.

Cast your ballot for a successful future!

256 I.C.S. COURSES

Whether you stand at a machine or sit at a desk . . . whether you're making $75 a week or $75 hundred a year . . . whether your interest is Power Plants or Paper Pulp, Advertising or Electronics . . . chances are I.C.S. has exactly the course you need to get ahead.

I.C.S. is not only the oldest and largest correspondence school. It also offers the most courses. 257 in all. Each one success-proved by graduates who rose to top technical and administrative positions. Chief engineers. Superintendents. Foremen. Managers. Executive assistants.

I.C.S. Courses cover bedrock facts and theory plus practical, on-the-job applications. No skimping. Texts are prepared by leading business and industrial authorities working with I.C.S. editors and educators. They are constantly being reviewed and revised in line with current developments.

As an I.C.S. student, you study in your spare time, set your own pace. No time lost getting to class or waiting for slower students to catch up. If you wish, I.C.S. will make progress reports to your employer. You win recognition as a "comer," one who is ready to move ahead. Thousands of students report pay increases and promotions within a few months of enrollment. All graduates win the coveted, approved I.C.S. diploma.

3 FREE BOOKS! Check the subject that interests you in the coupon below. I. C. S. will rush you (1) a special book outlining your opportunities in this field, (2) the 32-page gold mine of career tips, "How to Succeed," (3) a sample I. C. S. lesson (Math.) demonstrating the famous "I. C. S. Method." "X" MARKS OPPORTUNITY.

For Real Job Security—Get an I. C. S. Diploma! **I. C. S., Scranton 9, Penna.** Member, National Home Study Council

INTERNATIONAL CORRESPONDENCE SCHOOLS ICS

BOX 23968J, SCRANTON 9, PENNA. (Partial list of 257 courses)

Without cost or obligation, send me "HOW to SUCCEED" and the opportunity booklet about the field BEFORE which I have marked X (plus sample lesson):

ARCHITECTURE and BUILDING CONSTRUCTION
- ☐ Air Conditioning
- ☐ Architecture
- ☐ Arch. Drawing and Designing
- ☐ Building Contractor
- ☐ Building Estimator
- ☐ Carpentry and Millwork
- ☐ Carpenter Foreman
- ☐ Heating
- ☐ Interior Decoration
- ☐ Painting Contractor
- ☐ Plumbing
- ☐ Reading Arch. Blueprints

ART
- ☐ Commercial Art
- ☐ Magazine & Book Illus.
- ☐ Show Card and Sign Lettering
- ☐ Sketching and Painting

AUTOMOTIVE
- ☐ Automobiles
- ☐ Auto Body Rebuilding and Refinishing
- ☐ Auto Engine Tuneup
- ☐ Auto Technician

AVIATION
- ☐ Aero-Engineering Technology
- ☐ Aircraft & Engine Mechanic

BUSINESS
- ☐ Accounting
- ☐ Advertising
- ☐ Business Administration
- ☐ Business Management
- ☐ Cost Accounting
- ☐ Creative Salesmanship
- ☐ Managing a Small Business
- ☐ Professional Secretary
- ☐ Public Accounting
- ☐ Purchasing Agent
- ☐ Salesmanship
- ☐ Salesmanship and Management
- ☐ Traffic Management

CHEMICAL
- ☐ Analytical Chemistry
- ☐ Chemical Engineering
- ☐ Chem. Lab. Technician
- ☐ Elements of Nuclear Energy
- ☐ General Chemistry
- ☐ Natural Gas Prod. and Trans.
- ☐ Petroleum Prod. and Engr.
- ☐ Professional Engineer (Chem)
- ☐ Pulp and Paper Making

CIVIL ENGINEERING
- ☐ Civil Engineering
- ☐ Construction Engineering
- ☐ Highway Engineering
- ☐ Professional Engineer (Civil)
- ☐ Reading Struc. Blueprints
- ☐ Structural Engineering
- ☐ Surveying and Mapping

DRAFTING
- ☐ Aircraft Drafting
- ☐ Architectural Drafting
- ☐ Drafting-Machine Design
- ☐ Electrical Drafting
- ☐ Mechanical Drafting
- ☐ Sheet Metal Drafting
- ☐ Structural Drafting

ELECTRICAL
- ☐ Electrical Engineering
- ☐ Elec. Engr. Technician
- ☐ Elec. Light and Power
- ☐ Practical Electrician
- ☐ Practical Lineman
- ☐ Professional Engineer (Elec)

HIGH SCHOOL
- ☐ High School Diploma
- ☐ Good English
- ☐ High School Mathematics
- ☐ Short Story Writing

LEADERSHIP
- ☐ Industrial Foremanship
- ☐ Industrial Supervision
- ☐ Personnel-Labor Relations
- ☐ Supervision

MECHANICAL and SHOP
- ☐ Diesel Engines
- ☐ Gas-Elec. Welding
- ☐ Industrial Engineering
- ☐ Industrial Instrumentation
- ☐ Industrial Metallurgy
- ☐ Industrial Safety
- ☐ Machine Design
- ☐ Machine Shop Practice
- ☐ Mechanical Engineering
- ☐ Professional Engineer (Mech)
- ☐ Quality Control
- ☐ Reading Shop Blueprints
- ☐ Refrigeration and Air Conditioning
- ☐ Tool Design ☐ Tool Making

RADIO, TELEVISION
- ☐ General Electronics Tech.
- ☐ Industrial Electronics
- ☐ Practical Radio-TV Eng'r'g
- ☐ Practical Telephony
- ☐ Radio-TV Servicing

RAILROAD
- ☐ Car Inspector and Air Brake
- ☐ Diesel Electrician
- ☐ Diesel Engr. and Fireman
- ☐ Diesel Locomotive

STEAM and DIESEL POWER
- ☐ Combustion Engineering
- ☐ Power Plant Engineer
- ☐ Stationary Diesel Engr.
- ☐ Stationary Fireman

TEXTILE
- ☐ Carding and Spinning
- ☐ Cotton Manufacture
- ☐ Cotton Warping and Weaving
- ☐ Loom Fixing Technician
- ☐ Textile Designing
- ☐ Textile Finishing & Dyeing
- ☐ Throwing
- ☐ Warping and Weaving
- ☐ Worsted Manufacturing

Name _____ Age _____ Home Address _____

City _____ Zone _____ State _____ Working Hours _____ A.M. to P.M. _____

Occupation _____

Canadian residents send coupon to International Correspondence Schools, Canadian, Ltd., Montreal, Canada. . . . Special tuition rates to members of the U. S. Armed Forces.

Tense, Nervous Headaches Need This Relief

A survey shows 3 out of 4 doctors recommend the famous ingredients of Anacin to relieve pain. Here's why Anacin® gives better *total* effect in pain relief than aspirin or any buffered aspirin:

- **ACTS INSTANTLY:** Anacin goes to work instantly. Brings fast relief to *source* of your pain.
- **MORE EFFECTIVE:** Anacin is like a doctor's prescription. That is, Anacin contains not one, but a combination of medically proven ingredients.
- **SAFER:** Anacin simply *can not* upset your stomach.
- **LESSENS TENSION:** Anacin also reduces nervous tension, leaves you relaxed, feeling fine after pain goes. Buy Anacin Tablets *today!*

Shrinks Hemorrhoids New Way Without Surgery

Science Finds Healing Substance That Relieves Pain—Shrinks Hemorrhoids

For the first time science has found a new healing substance with the astonishing ability to shrink hemorrhoids and to relieve pain—without surgery.

In case after case, while gently relieving pain, actual reduction (shrinkage) took place.

Most amazing of all—results were so thorough that sufferers made astonishing statements like "Piles have ceased to be a problem!"

The secret is a new healing substance (Bio-Dyne*) —discovery of a world-famous research institute.

This substance is now available in *suppository* or *ointment form* under the name *Preparation H.** Ask for it at all drug counters—money back guarantee.

*Reg. U.S. Pat. Off.

DIESEL MEN WANTED

Earn $100 per week and up
AUTO-DIESEL MECHANICS

You learn fast in our school and shops because you learn with tools on real equipment. Experienced instructors explain WHY and show you HOW, then you DO IT YOURSELF with tools on various makes and models. One of the best equipped technical schools of its kind in the United States. Thirty-seven years' experience training men. Successful graduates in 48 states and many foreign countries. Approved for veterans. Day and evening classes. Earn While You Learn. Write for free bulletin.

NASHVILLE AUTO-DIESEL COLLEGE
226 7th Ave. N., Dept. 42 Nashville, Tenn.

Seal of Approval...

. . . for the home owner who wants to modernize and add to the comfort and value of his home.

Your home town lumber and building materials dealer featuring this authorized seal stands ready to help you glamourize your kitchen, convert attic space into a room for your growing youngsters, and turn your basement into a fun room.

POPULAR SCIENCE can help, too!

Those 'gleam-in-your-eye' ideas can actually be seen . . . can actually be carried out by following the home improvement hints in every issue of POPULAR SCIENCE. You'll find every issue full of easy-to-follow details on how to carry out those home modernization plans . . . full of advice on saving time, effort and money by doing the job yourself.

POPULAR SCIENCE

Bean's Free Catalog

Just off the Press

Fully illustrated, 108 pages, showing Hunting Footwear, Clothing, and one hundred and twenty other leather and canvas specialties of our own manufacture for campers and hunters.

L. L. Bean, Inc., 139 Main St., Freeport, Maine

Mfrs. Hunting and Camping Specialties

GROW **ORCHIDS** AT HOME

BIG PROFITS SPARE OR FULL TIME

World's most thrilling hobby – profitable home business.

Hundreds of Families Raising Orchids At Home With Our Help

Send for **FREE** information on temperature, light & humidity Orchids need in the home. Purple Orchids, white, yellow, every rainbow color. Many grow without soil, getting food from the air. Successful home grower offers complete growing instructions—tells how to market Orchid flowers & plants to neighbors, hotels, florists for good profits. Also **Mail Order** from big city, small town or farm. **Instructions include Blooming-size Orchid plant.** Send name and address for real **ORCHID SEEDS**, full details & "Quick-Profit" Plan—**ALL FREE.**

TROPICAL FLOWERLAND, Dept. 29, 100 So. Vermont, Los Angeles 4, Calif.

. . . Swiss or American

Unique Sweazey System starts you making repairs right away. Develops your skill step-by-step. Teaches **modern methods** . . . . . professional short cuts. Learn by **personal attendance** or spare time **home study. Free Sample Lesson.** No obligation. Write today!

CHICAGO SCHOOL OF WATCHMAKING
2330 Milwaukee, Dept. 497, Chicago 47, Ill.

Free! 75 ORIENTALS

Brought to you from the farthest ends of the earth—these exotic valuable genuine **STAMPS** of the Orient! 75 all-different from Borneo, Siam, China, Japan, Hong Kong, Malaya, Sarawak, Singapore—and other exciting mysterious lands of the Far East. **EXTRA!** Free booklet, bargain lists, fascinating offers for your free examination. Send 10c for mailing expenses.

JAMESTOWN STAMP CO., Dept. C3PS, Jamestown, N.Y.

SELL TO UNCLE SAM!

That's how I made $20,000 a year —selling junk jewelry to the U. S. Government. Send me your name and I'll show you how I did it.

LEARN AT HOME IN ONE EVENING

This is the most fantastic way of making money you ever heard of. That's because you do all your "selling" BY MAIL *to one customer*—the U. S. Government! Uncle Sam will buy all the old junk jewelry you send in at $35.00 AN OUNCE for the gold it contains. Just follow my Plan and you can pick up gold on any street in your town. I show you where to find it, what to pay, how to test and how to mail to Uncle Sam for cash. I'll teach you the secrets by which I made $20,000 a year. No charge for facts. No salesman will call. Send no money—just your name, address on postcard. **Leslie Patton, 335 W. Madison St., Dept. P-129, Chicago 6, Ill.**

MSOE • MSOE • MSOE • MSOE • MSOE • MSOE • MSOE • MSOE

Engineers Needed!

—say national industrial leaders

Become a

MECHANICAL ENGINEER

or

ENGINEERING TECHNICIAN

at

MSOE *in Milwaukee*

Yes, engineers are needed—and for every professional engineer, industry also requires five trained engineering technicians.

Choose MSOE to prepare yourself for a worth-while career in mechanical engineering or technology.

Complete laboratories, and field trips to some of the largest and most progressive industrial plants in Milwaukee—machine shop of the world.

Courses approved for veterans—A non-profit institution of higher learning.

—Governing board and advisory committees of leading industrialists.

Previous educational, military, and practical experience is evaluated for advanced credit.

Choose from these courses—

MECHANICAL ENGINEERING

B. S. Degree in 36-42 mos. Options in plant engineering, industrial engineering, design.

ENGINEERING TECHNOLOGY

Associate in Applied Science Degree in 18 mos. Options in air conditioning, industrial engineering technology.

TECHNICAL SCIENCE

Service certificate in 6 mos. Options in refrigeration or metals fabrication.

A complete series courses in Electrical Engineering in electronics or electrical power is also available.

QUARTERS BEGIN SEPTEMBER, JANUARY, APRIL, JULY

MILWAUKEE SCHOOL OF ENGINEERING

For more information, mail coupon today!

Milwaukee School of Engineering
Dept. PS-957, 1025 N. Milwaukee St.
Milwaukee, Wis. **MS-30**

Please send the new illustrated career booklet on Mechanical Engineering.

(Please Print)

Name..... Age.....

Address.....

City..... State.....

Are you eligible for veterans educational benefits? .....

Discharge date .....

PREPARE FOR THE BEST JOBS IN INDUSTRY

TRAIN at HOME in Your Spare Time or at ALLIED INSTITUTE in Chicago

- MECH. ENGINEER
- DRAFTSMAN
- TOOL DESIGNER
- TOOL ENGINEER
- MASTER MACHINIST
- AIR CONDITIONING HEAT & REFRIGERATION

MORE JOBS THAN GRADUATES

Shortages of Draftsmen, Designers, Tool Engineers, Machinists, Air Conditioning technicians are so widespread that you can pick a highly paid key job and look forward to Achievement and Security. You can begin your training in Short Courses at home or at Allied Institute, and continue progressively toward an Engineering Degree in 31 months. Allied is approved by Industry, National Home Study Council, Central Schools Association, Dept. of Education, Office of Public Instruction, State of Illinois, U. S. Dept. of Justice.

SEND FOR FREE BOOKS

ALLIED SCHOOL OF MECHANICAL TRADES
1338-42 South Michigan Ave., Dept. PS-9, Chicago 5, Ill.

Send me without obligation information on your courses:

☐ HOME STUDY ☐ RESIDENT ☐ VETERAN ☐ NON VETERAN
☐ DRAFTING ☐ ENGINEERING ☐ AIR CONDITIONING

NAME _____
ADDRESS _____
CITY _____ COUNTY _____ STATE _____

NEVER AT THIS LOW PRICE!

GENUINE 135-POWER ACHROMATIC TELESCOPE

with Achromatic Lens and 4-POWER FINDER attached

ONLY $18.95 PREPAID

EXTRA BONUS GIFTS:
- 273 page book, "Handbook of the Heavens"
- Magic Star Finder Dial
- 220X & 400X Eyepiece lenses

5 Magnifications 18X—35X—65X—85X—135X
Brings the Moon, Planets, Stars, People 135 Times Closer, Clearer, Sharper

Never before has an ACHROMATIC 135X telescope with range finder and tripod sold for anywhere near this amazing low price! Now you can not only explore the heavens and bring the moon, planets, stars 135 times closer, but you can observe all distant objects, people, ships too, because all pictures are erect, not upside down as in all astronomical telescopes—the "God of needle-sharp color-free viewing only a genuine achromatic lens can bring you. Ready for immediate use. 5 precision lenses bring you viewing at 18X-35X-65X-85X-135X Tube extend to 43" made of bakelite, finished in camera bellows black, trimmed with gleaming brass. 4 power finder scope (30mm Lens) mounted on main tube is feature usually found on more expensive telescopes—brings difficult objects on target before observing with main scope. For extra stability 5 ft. hardwood folding tripod is equipped with heavy cast iron head fitted with Criterion's famous 360 degree all aluminum mount that locks instantly in any position. Obtainable only from Criterion Co., shipped prepaid. 4 famous gifts—273 page book, "Handbook of the Heavens"; Magic Star Finder dial that aids in locating stars ANYWHERE at ANY-TIME of the year; 220X & 400X eyepiece lenses included free for experiments. You must be completely satisfied with this super offer or your money back in full. Shipped Complete, nothing else to buy. At amazingly low price of..... **$18.95**

Without tripod $14.95.

Send Cash, Check or Money Order today

Dept. PST19, CRITERION CO., 331 Church St., Hartford, Conn.

SAVE $200.00 and more—IMMEDIATE PROFITS

BOTH FREE! *Write!*

This FREE Lesson Proves You Can

Learn TV Repair in one short week!

Why pay up to $250 for training — study months or years? My new SIMPLIFIED TV REPAIR METHOD lets you make $10 to $20 the first day! No confusing electronic "double talk"—but a wealth of practical *"know how."* 1000's have already proved that if you can replace a lightbulb, you can make good money *immediately*, repairing all makes of sets. It's amazing—and, it's true! For *proof* send for FREE Sample Lesson and Business Plan *now!* No salesman will call. ELECTRONIC ENGINEERING, Dept. A-189, 1038 So. LaBrea, L. A., California

BARBELLS

100 POUND SET $11.80

Extra Plates Only 10c Pound

140-Pound, CHROME DELUXE Barbell-Dumbbell set only $19.80.

This is our feature set and is the finest ever manufactured.

Training with adjustable weight is the BEST way to keep fit; the ONLY way to develop great strength and a perfect body. As the oldest and best equipped barbell company, BUR gives value and prices no one can equal.

SEND FOR FREE CATALOG.
BUR BARBELL CO.
Lyndhurst 5, New Jersey

ANSEN AUTOMOTIVE

NEW! ILLUSTRATED POWER & SPEED CATALOG!

OVER 500 PICTURES · TUNING TIPS · COMPLETE DATA ON ALL LATEST CARS!

WRITE TODAY! 75¢

6317 S. Normandie
Los Angeles 44, Calif. Dept. PS-9

ANY SEASON . . . ANY ROAD
A HULL AUTO COMPASS
Repeatedly Earns Your Gratitude by Eliminating
• Confusion • Wrong Turns • Lost Bearings

Beaconlite ILLUMINATED $6.50 Streamline NON-ILLUMINATED $4.95

HULL MANUFACTURING CO., P. O. Box 246-E-9, Warren, Ohio

When Writing to Advertisers Please Mention Popular Science

BE YOUR OWN COLOR stylist $3.95

COMPLETE HOME DECORATING COURSE IN A KIT

The exciting new COLOR STYLIST kit actually lets you see your rooms in full color: BEFORE YOU DECORATE! Start with your rug color (drapes, etc.), then select from Decorator approved color schemes that complement your present furnishings. Easy new method gives anyone complete mastery of color . . . you can mix any color instantly and accurately with plastic count-a-drop bottles. Sixteen room sketches to paint and compare in your own home.

KIT INCLUDES: Interior Decorating handbook and complete outfit for color styling . . . brush, tempera paints, room sketches, color scheme Selector Chart, Color Locator Wheel, directions, hundreds of color formulas. Approved and used by leading decorators. Color Stylist gives professional results for the amateur every time! $3.95 plus 25¢ postage and handling. No C.O.D.'s. Order today!

CODE COLOR COMPANY Dept. P
P.O. BOX 350, EVANSTON, ILLINOIS OR
P.O. BOX 64582, LOS ANGELES, CALIF.

Draw Me

You may win a $375.00 Scholarship in Professional Art

Winner of prize gets a complete art course—free training for a profitable career in advertising art, illustrating or cartooning. You are taught, individually, by professional artists on the staff of world's largest home study art school. Many top artists today have studied with this school. Try for this free art course! As winner you also get a drawing outfit and a series of valuable art textbooks.

DRAW THIS GIRL'S HEAD
5 inches high. Use pencil. Drawings for October 1957 contest must be received by October 31. None returned. Winner notified. Amateurs only. Our students not eligible. Mail your drawing today.

ART INSTRUCTION, INC., STUDIO 9147
500 South 4th Street, Minneapolis 15, Minnesota

Please enter my attached drawing in your "Draw Me" contest. (PLEASE PRINT)

Name_____ AGE____ Phone_____

Address_____ City_____ Zone____

County_____ State_____ Occupation_____

Skin Irritated After Shaving?

Cuticura Medicated Liquid Relieves Instantly—Speeds Healing of Cuts, Nicks, Cold Sores, Externally Caused Pimples, Rashes!

"Invisible". Greaseless. Fast Drying. For truly sensational results use Cuticura Medicated Liquid with Cuticura Soap. Liquid, 60¢. Soap, 29¢.

Buy at local store—or *send 10¢ to cover mailing costs for generous samples of Soap and Liquid. Address Cuticura, Dept. 99, Malden 48, Mass.*

Fastest Known Relief

SPRINGFIELD 30/06 RIFLES AGAIN!

SHARP, CLEAN BORES 4 GROOVES, THE FINEST!

AMMO SPECIALS:
Box of 20 rds. G.I. target, 150 gr. ... $2.00
100 rds G.I target 150 gr. $7.50
20 rds professionally loaded soft point hunting, 150 gr. $2.95
20 rds. Rem. or Western Commercial soft point, 110 gr., 150 gr., 220 gr., YOUR CHOICE $4.75

GOLDEN STATE ARMS CORP.
386 W. Green St. Pasadena 1, Calif.

ACCESSORIES BARGAINS
Slings. U.S. gov't regulation cowhide. New ... $1.95 Used ... 95c
Swivel handle cleaning rod, 3 pc. & tips solid brass. Gov't issue ... $1.95
Brushes: U.S. Army Brass, official, one, 2 for ... 25c
Oil: G.I. gun oil, 6 oz. can ... 25c
Patches: G.I. cleaning patches, flannel (200) ... 75c
Solvent: G.I. gun cleaning solvent, 6 oz. ... 25c
Gun Case: G.I. olive drab, heavy-duty, brand new condition, heavy gov't spec. zipper ... $1.95
Saddle scabbards, U.S. official top quality cowhide, riveted and stitched. NEW $4.95

TO ORDER: Send check, cash or money order. $10 deposit for C.O.D. Shipped RR Ex., charges collect F.O.B. Pasadena, Calif. resid. add 4% state tax. 10-DAY MONEY BACK GUAR. Dealers inquire.

ON SALE JUST $39.95

HUNTERS:
For the first time in 2½ years, we can again offer the famous U.S. Springfield '03 Caliber 30-06. These are guar. very good inside and out, clean sharp rifling. This is most accurate military rifle ever made, most popular hunting rifle and caliber in world. Soft-nose ammo sold everywhere. Single Springfields sell as high as $75. Get yours now while they last!

SPECIFICATIONS:
Model: '03. **Bbl.:** 24", 4 groove (not 2 groove). **Sights:** Famous Springfield sights adjustable to 2700 yds. Windage and elevation. **Stocks:** Gov't selected American Walnut. **Caliber:** 30-06. **Numbers:** all high numbers. **Packing:** Guns shipped to us in orig. army cosmoline. We degrease and oil lightly. Shipped in heavy duty protective packing case. **ALL MILLED PARTS:** no hurry-up war time stampings. **Wt.:** approx. 8½ lbs. **Shipping Wt.** 10 lbs.

Now! Save Over $3 per 100

ON AMAZING

Food Supplement

16 VITAMINS 12 MINERALS

In a Single Tablet

Including the Important "RED" Vitamin B_{12} Along With Other Stimulants for the Growth of

RED BLOOD CELLS

Try this FRESHLY-PACKED Guaranteed-Potency all-Vitamin Mineral Formula, PLEMS—Containing 28 Nutritional Factors—at a cost of $2.35 for 100 Tablets—one a day is an adequate dose!

Compare the potencies of this splendid tablet with any Vitamin-Mineral formula or food supplement regardless of name or price and get quick proof this remarkable value cannot be equalled anywhere in America!

Each PLEMS tablet contains

Vit. A 5,000 USP units		Fluorine	0.1 Mg.	Rutin	1 Mg.
Vit. D 1,600 USP units		Iron	15 Mg.	Choline	10 Mg.
Vitamin B-12	2 Mcg.	Calcium	143 Mg.	Inositol	10 Mg.
Folic Acid	0.3 Mg.	Manganese	1 Mg.	Iodine	0.15 Mg.
Vitamin C	50 Mg.	Cal. Pantothenate	3 Mg.	Molybdenum	0.5 Mg.
Vitamin B-1	5 Mg.	Niacinamide	20 Mg.	Potassium	5 Mg.
Vitamin B-2	2 Mg.	Vitamin K	0.2 Mg.	Zinc	1 Mg.
Vitamin B-6	0.5 Mg.	Vitamin E	1.25 I. U.	Magnesium	10 Mg.
Cobalt	0.15 Mg.	Biotin	1 Mcg.	Phosphorus	110 Mg.
Copper	1 Mg.				

100 Tablets $ 2.35 250 Tablets $ 5.25
500 Tablets $10.00 1,000 Tablets $19.00

One tablet daily meets or exceeds the MINIMUM daily Vitamin requirements

PLEMS are sold only at the addresses below. We pay all postage. Order C.O.D. or save all charges by sending check or money order. Money back if not satisfied.

VITAMIN-QUOTA

One of the world's largest distributors of vitamins. Est. 1923. Serving over 1,500,000 families, coast-to-coast.

Dept. T-750, 880 Broadway, N.Y. 3, N.Y., or
Dept. T-750, 1125 Crenshaw Blvd., Los Angeles 19, Cal.
Sales in California, add 4% to total of order.

ENGINEERING

DEGREE IN 27 MONTHS

B.S. DEGREE IN

AERONAUTICAL, CHEMICAL, CIVIL, ELECTRICAL, MECHANICAL and ELECTRONIC ENGINEERING (Inc. Radio and TV)

Also B.S. DEGREE in 36 mo. in Mathematics, Chemistry, Physics (including Nuclear Physics). Engineering Science preparatory courses. Thorough, practical program. Individualized instruction emphasized. Government approved for G. I.'s

Keeping pace with progress in science and engineering

Spacious campus. 20 buildings; dormitories, gymnasium. Playing field. Modern, well-equipped laboratories including new physics lab and wind tunnel. Low tuition. New terms start quarterly. Enter September, December, March, June. Big demand for graduates. Students from 48 states and 46 foreign countries. Many earn a major part of their college expenses in this large industrial center. Send coupon for free catalog and full information. Enroll now!

INDIANA TECHNICAL COLLEGE

697 E. Washington Boulevard, Fort Wayne 2, Indiana

Please send me free information on *27 Mo. B.S. DEGREES* in:
Aeronautical ☐ Chemical ☐ Civil ☐ Electrical ☐
Mechanical ☐ Electronics ☐
on *36 MONTH B.S. DEGREES* in:
Mathematics ☐ Chemistry ☐ Physics ☐

Name.....

Address.....

SMITH & WESSON .38 REVOLVER $24.95

GUAR. VERY GOOD CONDITION

British 1956 proof house marks guarantee quality—5" bbl., 6-shot, double and single action combined English style lanyard ring. Weight: 39 oz. This gun was issued to British WW II Commandos, S.A.S. (para commandos). Official military and police model. Sells new today for about $60. .38 S&W ammo, available at all gun stores. 10-day money back guarantee. A wonderful home protection, target and camping weapon. TO ORDER: Send check, money order or cash. ½ deposit for C.O.D. Calif. resid. add 4% state tax.

CADMUS INDUSTRIES, 43 Craft Bldg.
5880 Hollywood Blvd., Los Angeles 28, Calif.

REAL ESTATE

BE A BROKER

PAYS BIG! SEND FOR FREE, BIG, ILLUSTRATED CATALOG NOW! Graduates report making substantial incomes. Start and run your own business quickly. Men, women of all ages, learn easily. Course covers Sales, Property Management, Appraising, Loans, Mortgages, and related subjects. **STUDY AT HOME** or in classrooms in leading cities. Diploma awarded. Write TODAY for free book! No obligation.

FREE BOOK TELLS HOW

Approved for World War II and Korean Veterans

WEAVER SCHOOL OF REAL ESTATE (Est. 1936)
20208 Grand Ave. Kansas City, Mo.

• POLIO • REHABILITATION
• NEUROMUSCULAR

Sister Elizabeth KENNY Foundation

National Headquarters • Minneapolis, Minn.

3 INCH 50, 105 and 310 POWER REFLECTING TELESCOPE $24.95 COMPLETE

PLUS 3 POWER FINDER SCOPE

A professional-performing instrument for serious minded Astronomers. Saturn's rings, Jupiter's satellites, moon's mountains and craters are but a few celestial wonders to be seen clearly and distinctly. Telescope is 58" bakelite tube mounted on rigid 3 ft. hardwood tripod with cast iron head. Has equatorial and altazimuth mount. All-machined polar and declination axes have tension screws, and each, A 3" F-13 mirror aluminized and overcoated guaranteed to resolve to Dawes limit for its size. A 3X finder scope quickly locates target. This all-assembled telescope with 3 eyepieces, finder scope and tripod $24.95 FOB Mattituck. Sent express. Satisfaction guaranteed.

SUFFOLK SCIENCE SERVICE, Dept. PS-9, MATTITUCK, N. Y.

Train for a GOOD JOB and a REAL FUTURE in

Electricity Electronics

in the great shops of

COYNE

Largest, Oldest and Best Equipped School of its Kind in U.S. Train the Coyne way for a better job in *Electricity-Electronics—a field that offers a world of opportunities now and in the years ahead.* In industry—in the home—New developments and fabulous growth are creating increasing job opportunities. AUTOMATION ELECTRONICS—one of the more recent applications of Industrial Electronics to manufacturing processes—promises to create additional demands for trained Electrical-Electronics men such as we have never seen. Coupon brings details.

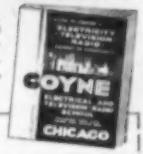
LARGEST, OLDEST AND BEST EQUIPPED SCHOOL OF ITS KIND IN U.S.

TRAIN IN CHICAGO SHOPS—Practical work plus technical training. No advanced education or previous experience needed. Lifetime Employment Service to Coyne Graduates.

START NOW—PAY LATER Training offered to VETS and NON-VETS alike. New liberalized credit terms and Finance Plans. Part-time employment service to students.

COYNE ELECTRICAL SCHOOL
CHARTERED NOT FOR PROFIT
500 S. Pauline Street, Chicago, Dept. 67-73

MAIL COUPON FOR FREE BOOK. "Guide to Careers" gives you all the facts, answers your questions. All information will come by return mail. No obligation and no salesman will call, so send coupon now!



Coyne Electrical School, Dept. 67-73
500 S. Pauline St., Chicago 12, Ill.
Send FREE BOOK and details of the training you offer in Electricity-Electronics.

Name _____

Address _____

City _____ State _____

(I understand no Salesman will call.)

Authenticast MINIATURE MILITARY MODELS

PRECISION DETAILED ACCURATELY SCALED

USS Missouri (Iowa class) $2.85

Realistic gems - Cast in metal directly from Gov't. blueprints. Send for Authenticast catalog showing full line of model ships, tanks, planes of all nations, as well as model RR items - 35¢

5190 Heavy Tank T98 E-1 $2.00

COMET METAL PRODUCTS CO. INC. RICHMOND HILL 18 N.Y. N.Y.

LEARN MEAT CUTTING AT NATIONAL

Pay After Graduation

The steady dependable trade of Meat Cutting taught easily in 8 short weeks. YOU LEARN BY DOING under actual meat market conditions in big modern school at Toledo.

For beginners or men with experience. Get a profitable store of your own. Remember, PEOPLE MUST EAT! Big pay jobs. Free employment help. Thousands of successful graduates.

Buying, cutting, percentage, pricing, advertising, selling, etc. A complete retail meat education. National School established 35 years. Get National training NOW. Pay your tuition in easy weekly payments after you graduate. Send coupon for FREE 52 page school catalog — TODAY. G.I. approved.

National School of Meat Cutting, Inc.
Dept. 61-V, Toledo 4, Ohio

Send me your FREE school catalog on National Training at Toledo in Meat Cutting, Meat Merchandising and Self Service Meats. No obligation. No salesman will call.

Name ..... Age .....

Address .....

City ..... State .....

Approved for training Korean Veterans

BE YOUR OWN MUSIC TEACHER

Send for Free Book Telling How Easily You Can Learn Piano, Guitar, Accordion, ANY Instrument This EASY A-B-C Way

NOW IT'S EASY to learn music at home. No tiresome "exercises." No teacher; just START RIGHT OUT playing simple pieces. Thousands now play who never thought they could. Our pictured lessons make it easy as A-B-C to learn to play popular music, hymns, classical, and any other music. Only a few cents a lesson. Some of our 900,000 students, like Lawrence Welk, are now band LEADERS! (Our 59th successful year.)

Mail Coupon for FREE Book

Find out why our method can teach you quickly, easily, inexpensively. Write for 36-page illustrated book. No obligation. Mention your favorite instrument. Just mail coupon. (No salesman will call.)

U. S. SCHOOL OF MUSIC
Studio A159, Port Washington, N. Y.

FREE BOOK

U. S. SCHOOL OF MUSIC, Studio A159, Port Washington, N. Y.
Please send me Free 36-page Illustrated Book. I would like to play (Name instrument).

Instrument _____ Have you Instrument? _____

Name _____ (Please Print)

Address _____

BUILD IT YOURSELF

Heathkit
BROADCAST BAND
RECEIVER KIT

Have you ever experienced the thrill of building your own radio? Invest a few of your dollars—a few hours of your time, and build a truly worthwhile broadcast band receiver. Transformer operation eliminates potential shock hazard characteristic of "economy" AC-DC sets. Operates as radio, phono, amplifier, or tuner. Fine tone quality, excellent sensitivity. Simplified Construction Manual outlines basic theory of radio principles. Actually a radio course in itself. Price includes tubes—speaker—chassis, etc. Every part you need! Order your Heathkit Radio Kit today.

MODEL BR-2
$19.25 incl. fed. excise tax (Less Cabinet)
SHPG. WT. 10 LBS.

OTHER "BUILD IT YOURSELF" *Heathkits*

- Oscilloscope
- Vacuum Tube Voltmeter
- Signal Generator
- Amateur Transmitter
- Communications Receiver
- Multimeter
- Handitester
- Hi-Fi Amplifier
- Hi-Fi Preamplifier
- Battery Eliminator
- Signal Tracer
- Tube Checker

(and over 50 others)

WRITE FOR Free CATALOG

HEATH COMPANY
A Subsidiary of Daystrom, Inc.
BENTON HARBOR 16, MICH.

AMERICA'S MOST EXCITING SPORT

MICRO-MIDGET RACING is America's fastest growing sport. Now anyone from 18 to 60 can own a real racing car and have all the thrills and excitement of SPEEDWAY RACING.

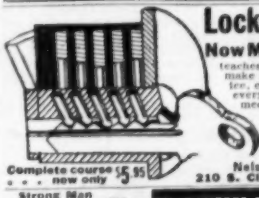
The all-new **1957 COMET** is the ultimate in Micro-Midgets and has no equal. Send 25¢ for illustrated literature describing all details.

The HANDBOOK for SMALL RACING CARS
The ALL-NEW 5th Edition of this very popular Handbook is jam-packed with EXCITING ARTICLES, ACTION PICTURES, PLANS, SPECIFICATIONS, ENGINE INFORMATION, TRACK and RACING DATA, HOW TO START A RACING CLUB, HOW TO BUILD A TRACK, ALL RULES and REGULATIONS, etc., for ¼ MIDGETS, MICRO-MIDGETS, ⅛ MIDGETS, 500 cc CARS, and FULL-SIZED MIDGETS. You've never seen a book filled with so much ACTION, EXCITEMENT, and VITAL INFORMATION. It also serves as a COMPLETE CATALOG telling where to buy ENGINES, WHEELS, INDIVIDUAL PARTS, SUPPLIES, and COMPLETE CARS. All for **ONLY $1.00.**

COMET MANUFACTURING CORPORATION Dept. PS-9 Box 74397 Los Angeles 4, Calif.

EXCLUSIVE DOUBLE-BEARING
HEAVY DUTY PUMPS

IRRIGATE • DRAIN • CIRCULATE • SPRAY
Up to 7,500 GPH; 1,000 GPH 60' high; or 3,000 GPH from 25' well. Use ¼ to 1 HP motor. 1¼" inlet; 1" outlet. Stainless shaft. **TYPE X**—3 oil-less bronze bearings. Won't rust..... **$10.95**
TYPE XB—Ball bearing model. Best for belt drives..... **$12.95**
Postpaid if cash with order.
Don't delay—send for yours today!
MONEY BACK GUARANTEE
Centrifugal and Gear Pumps in All Sizes
LABAWCO PUMPS, Belle Mead 4, N. J.



Locksmithing AND KEY MAKING

Now Made Easy! **Practical up-to-date course**

teaches you how to pick locks, de-code, make master keys, repair, install, service, etc. New self-instruction lessons for every handyman, homeowner, carpenter, mechanic, service station operator, fix-it shop, hardware dealer, gunsmith. 53 easy illustrated lessons. Full price only $5.95, postpaid; or C.O.D. plus postage. Satisfaction or refund guaranteed.

Complete course $5.95 . . . now only

Nelson-Hall Co., Dept. JT-1
210 S. Clinton St., Chicago 6, Ill.

Strong Man DAN LURIE

GUARANTEES TO BUILD YOUR MUSCLES FAST!

In just 6 weeks my amazing body mold course and famous adjustable barbells must give you bigger muscles, sensational power or money back. Get "revolutionary body mold" courses free with order. *Lowest factory price.*

DAN LURIE BARBELLS
50 LB. set 8.98 — 100 LB. set 14.98
150 LB. set 21.98 — 200 LB. set 27.98
Extra wts. 16¢ per lb. 50% cash with order. Balance C.O.D. F.O.B. plant.

DAN LURIE BARBELL CO.
52PS Bristol St. Dept. 770-J Bklyn 12, N.Y.

FREE! Send For New Sports & Health Catalog

WRITE TO-DAY for FREE BOOK

be a CAMERA CRAFTSMAN

LEARN AT HOME

CAMERA REPAIRMEN greatly needed! You can learn manufacturers' service methods at home, in your spare time! Write today.

NATIONAL CAMERA REPAIR SCHOOL
Dept. PS-1 Englewood Colorado

FOR BIG MEN ONLY!

SIZES 10 - 16 — WIDTHS AAA - EEE!

We specialize in LARGE SIZES ONLY—sizes 10 to 16; widths AAA to EEE. Dress, sport, casual and work shoes; golf shoes; insulated boots; sox; slippers; rubbers; overshoes; shoe trees. Also . . . sport shirts in your exact, extra-long sleeve length. Enjoy perfect fit in your hard-to-find size at amazingly low cost. Satisfaction Guaranteed. Sold by mail only. Write for FREE Style Book TODAY!

SEND FOR FREE CATALOG

KING-SIZE, INC. 346 Brockton, Mass.

GIANT BALLOONS —3 for $1.25

Surplus US Govt. (New overage) Neoprene weather target balloons.
FOR FUN in the backyard; at parties, picnics, etc! Young and old love 'em.
FOR ADVERTISING—Attracts crowds to civic events, business openings, trade shows, fairs. Low cost, high returns!
Paint on sales message, seen for miles!
FOR PROMO—Makes any dance more festive. Ideal for high school or college affairs! The more you use the better.

Approx. inflated sizes
3 ft. dia. **49c** ea. **(SPECIAL!** 3 for **$1.25)**
5 ft. dia. **99c** ea.

Postage paid on prepaid orders. Calif. res. add sales tax.

PRISMS $1.50

Made for U.S. govt for tank periscopes. Fine optically ground, big precision prisms with silvered base. Terrific for all types of spectrographic work, in homemade telescopes & other optical systems for bending rays. Makes unusual paper weight (paint your name on it) or conversation piece for mantel. You'll find many other uses. NEW, PERFECT! Cost U.S. govt. $25 ea. **NOW—$1.50 ea. ppd.** or **4 for $5.00 ppd.** Calif. res. add sales tax.

VOLUME SALES CO., War Assets Division
3930 Sunset Blvd., Dept. PS-957, Los Angeles 29, Calif.

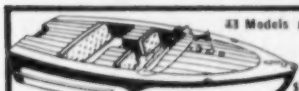
DO YOU NEED MONEY?

TO PAY FOR YOUR AERONAUTICAL ENGINEERING EDUCATION AND LIVING EXPENSES

while attending school in California?

NORTHROP INSTITUTE'S CO-OP Training Plan is the answer. Write for complete details. No obligation. Also get free Northrop Catalog describing TWO YEAR AERONAUTICAL ENGINEERING CURRICULUM. Remember, there is a waiting list for Northrop Institute Graduates! Approved for Veterans. Send name, address, age and veteran status.

MAIL TO: NORTHROP AERONAUTICAL INSTITUTE
1157 W. Arbor Vitae Street, Inglewood 1, Calif.



43 Models 8 ft. thru 18 ft.

$39.25 Up
Freight Pd

BOAT KIT CATALOG Free!

EQUAL TO FACTORY BUILT BOATS
Luger Kits Save you ½ to ⅔ Cost

Assembled and finished by inexperienced owners. Luger kit boats equal factory-built in style, beauty, speed, handling. Send for BIG catalog showing cruisers, runabouts, convertibles, fishing boats; also Fiberglas, hardware, trailers, accessories.

LUGER INDUSTRIES, INC. DEPT A-9 3404 Lyndale So. Minneapolis 7, Minn.

BUY WHOLESALE!

SAVE 30-80%

FOR SELF OR RESELL FOR BIG PROFITS! NAME BRAND APPLIANCES, TOOLS, WATCHES, CAMERAS, PHONOS, SEWING MACHINES, JEWELRY, HOUSEWARES, SPORTING GOODS, TYPEWRITERS, ETC.

SAVE $50.25!
PRISMATIC BINOCULARS
Precision built for brilliant magnification! Coated achromatic 6x30 lenses, individual focusing, folds on center pivot. FREE hard leather case.
$14.75 ppd. Money Back Guarantee

POWERFUL All-Purpose
PAINT SPRAYER
Apply paint, enamel, varnish, lacquer, etc. 50% faster! Completely self contained, no extras to buy! Just plug in — press trigger and spray! A professional job every time!
$7.72 ppd. Money Back Guarantee

GET OUR BIG WHOLESALE CATALOG OF OVER 2,000 PROFIT MAKING ITEMS! POSTCARD BRINGS DETAILS FREE! MAIL TODAY!

Consolidated DISTRIBUTORS
CLIFTON 4 N. J.

MAKE MORE MONEY get into

TELERAMA TELEVISION • ALL 8 BRANCHES OF ELECTRONICS • RADIO •

IN ONE DYNAMIC, MODERN SHOP METHOD, HOME TRAINING COURSE

You get and keep ALL this modern, newest, practical equipment!

* Registration applied for

YOU COVER ALL 8 BRANCHES IN ONE MASTER COURSE, ONE LOW TUITION

1. Television-including color TV
2. Radio — FM & AM
3. Industrial electronics
4. Sound recording and Hi-Fidelity
5. Preparation for FCC License
6. Automation
7. Radar & Sonar
8. Communications

- Parts to build a modern TV set, including large screen Picture Tube.
- Parts to build a powerful Superhet Receiver, standard broadcast and short wave.
- Parts to conduct many experiments and build — • Continuity Checker • RF Oscillator • TV Circuits • Audio Oscillator • TRF Receiver • Signal Generator
- Professional Multitester
- A MUST for all technicians

FOR MEN WHO WANT TO EARN MORE MONEY!
Another great advance in Home Study Training. Let National Schools, of Los Angeles, a practical Technical Resident Trade School for over 50 years, train you at home by Shop-Method, for today's unlimited opportunities in ALL 8 BRANCHES of the Television, Electronics, Radio industry

YOU DO MANY PRACTICAL JOBS — including servicing, circuit analysis. Build a modern TV set from ground up, with equipment kits we send you, including a new large-screen picture tube and professional Multitester, at no additional charge. You receive an experiment lesson with each kit. **EARN AS YOU LEARN.** Graduate Employment Service.

SEND FOR FREE FACT-BOOK AND SAMPLE LESSON

RESIDENT TRAINING AT LOS ANGELES
If you wish to take Resident Training at Los Angeles in our big, modern Shops, Labs, and Studios check special box in coupon for full information.

NATIONAL SCHOOLS
4000 S. FIGUEROA ST., LOS ANGELES 37, CALIF.

NATIONAL SCHOOLS

TECHNICAL TRADE TRAINING SINCE 1905
Los Angeles, California

GET FAST SERVICE - MAIL NOW TO
NATIONAL SCHOOLS, DEPT. RC-97
4000 S. FIGUEROA ST
LOS ANGELES 37, CALIF

Rush free TV Radio "Opportunity" Book and sample lesson. No salesman will call.

NAME _____ BIRTHDAY _____ 19__
ADDRESS _____
CITY _____ ZONE _____ STATE _____
( ) Check if interested ONLY in Resident School Training at Los Angeles
VETERANS: Give date of discharge _____

"TOOK IN $217 FIRST 10 DAYS"

Some make more, some less

We help you to start Your Own All-Year Business

Make Big Money! With our easily operated, highly efficient wall washer, Chas. Stelle took in $217 gross in first ten days. E. L. Goss took in more than $10,000 in one year. E. C. Taber wrote, "*I made $400 gross in two weeks.*" And no wonder—this machine washes walls 6 times faster and better than by hand. **Your Money-making Opportunity.** Enjoy *independence*—freedom from bosses, layoffs. Customers everywhere—homes, offices, schools, etc. Expenses low, profits high. No shop necessary; operate from home. Can start spare time until your full time is available.

Lose no time. Get all facts without obligation

FREE BOOK! MAIL COUPON TODAY!

VOM SCHRADER MFG. CO.
911 "W" Pl., Racine, Wisconsin

Send at once (no obligation) your **FREE** booklet containing information about your WALL WASHING MACHINE and how I can start my own permanent, profitable business.

Name _____

Address _____

City _____ Zone _____ State _____

Yours FOR JUST 10¢

This $4.95 Regular Size Presto Fire Extinguisher for Letting Us Prove How YOU CAN MAKE UP TO $1,000.00 A MONTH!

C. Kama of Texas Making Even More—Said, "Haven't Touched Bottom Yet!"

We DARE make this amazing offer because we're **certain** that once you actually use a PRESTO to put out a demonstration fire in a bucket—you'll realize why it "sells on sight" to car owners, homes, stores, farms, boats, offices, factories, and to stores for re-sale. PRESTO's startling chemical is 1½ to 6 times as effective as ordinary extinguisher chemicals on equal-weight basis . . . permits light, handy extinguisher even a child can use!

Here's Our Daring 10c Offer!

Send your name and address with only 10¢ TODAY—and we'll send you a regular $4.95 PRESTO at once. Then you can demonstrate this miracle fire extinguisher to yourself and friends and see for yourself. If not amazed, return PRESTO to us and we'll refund your 10¢. Or keep it at this big saving when you order 6 or more. You can't lose. You risk nothing. We'll also send you FREE a complete Sales Kit to help you get started. Act now. Write to **MERLITE INDUSTRIES (Presto Div.), 114 E. 32nd St., Dept. X-16A, New York 16, N. Y. IN CANADA: Mopa Co., Ltd., 371 Dowd St., Montreal 1, P. Q.**

Modernize and Add New Living Space To Your Home

There are so many wonderful things that can be done around the house to better your everyday living.

Each month POPULAR SCIENCE shows you how!

Visit your favorite local lumber and building materials dealer and explain to him that you want to add some built-ins, revamp your kitchen . . . put up bunk beds in the attic for your little "cowboys and cowgirls" . . . and insulate to stay warm and reduce fuel bills.

Don't forget to tell your dealer that your ideas came from POPULAR SCIENCE. He knows all POPULAR SCIENCE how-to-do-it hints are simple to understand, accurate and easy to follow.

It's time to better your living by modernizing your home.

POPULAR SCIENCE

No Nagging Backache Means a Good Night's Sleep

Nagging backache, headache, or muscular aches and pains may come on with over-exertion, emotional upsets or day to day stress and strain. And folks who eat and drink unwisely sometimes suffer mild bladder irritation . . . with that restless, uncomfortable feeling.

If you are miserable and worn out because of these discomforts, Doan's Pills often help by their pain relieving action, by their soothing effect to ease bladder irritation, and by their mild diuretic action through the kidneys—tending to increase the ouptput of the 15 miles of kidney tubes.

So if nagging backache makes you feel dragged-out, miserable, with restless, sleepless nights, don't wait, try Doan's Pills, get the same happy relief millions have enjoyed for over 60 years. Ask for new, large economy size and save money. Get Doan's Pills today!

250 POWER . . . . .

Complete Telescope Lens Kit only **$3.49** postpaid

Conquer Space, Explore the Universe, Planets, Moon craters, New Stars, etc. Complete Lens Kit consists of 60 inch focal length ground and polished objective lens, eyeniece lenses for 50 POWER, 100 POWER, 150 POWER, 200 POWER, 250 POWER, and all necessary lens fittings. Easy to make from simple step by step instructions. (Tripod and mount not included.) Money back guarantee.

BUSSE SALES CO., Hartford, Conn., Dept. PS-59

ART LEARN AT HOME!

Enjoy glamorous high-pay career or profitable hobby. Learn Commercial Art, Illustrating, Cartooning, Fashion Art, Lettering, T. V., etc. We train you at home, in spare time. Low cost. 22-pc. art outfit free of extra cost. **Write for FREE Book** describing easy method. No obligation. No salesman will call on you. **Washington School of Art, Studio 159, Port Washington, N.Y.** (Estab. 1914)

***Find* HIDDEN TREASURES**

GOLD, SILVER, PRECIOUS METALS with the Famous Model 27 Metal Detector. Lightweight, ultra-sensitive, low cost. None finer. Also GEIGER COUNTERS for uranium and the VIOLET Ray Prospector. INFORMATION FREE

THE *Detectron* CORP.
5528 Vineland Ave., No. Hollywood, Calif.

FIX OUTBOARD MOTORS

POWERMOWERS, AND ALL SMALL 2 & 4-CYCLE GASOLINE ENGINES

Repair your own equipment or MAKE EXTRA MONEY in this growing field. Fully illustrated, easy-to-understand, Home Study Course. Write for FREE information.

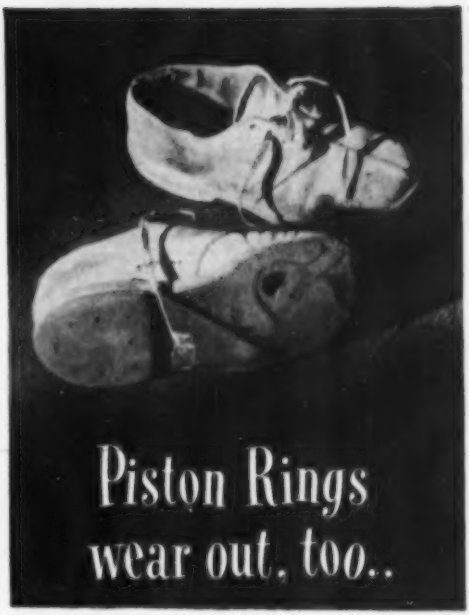
LINCOLN TECHNICAL INSTITUTE
SUITE 9-G, 472 MARKET STREET, NEWARK 5, N. J.

WARN HUBS Oil YOUR **'Jeep'**
STOP FRONT DRIVE WEAR

Over 100,000 Warn Hubs are now in use, proof that free-wheeling 2-w.d. with Warn Hubs means big savings in gear, engine, tire wear, gas, plus more pep, performance, power in high and easier steering. Now, with Warn Lock-O-matics, you have economical, drag-free 2-w.d. or tractive 4-w.d. automatically, as you shift! Ask your local 4-w.d. dealer to install Warn Lock-O-matic or Locking Hubs today. Fully guaranteed. Write for free literature.

Models for all 4 w.d. to Vis Jeep

WARN MFG. CO., Riverton Box 6064-B9, Seattle 88, Wn.



You can't see the wear on your piston rings. But you can feel it—in your engine's loss of power—and in your pocketbook.

At the first sign of oil-pumping, smoking exhaust or loss of power, ask your motor specialist for a ring check-up. If your car needs new rings, you'll be money ahead on gas and oil . . . and avoid big repair bills later on by installing new Hastings Piston Rings now.

They stop oil-pumping, seal compression and provide the special lubrication worn engines need.

Don't gamble with the power and economy that are built into your engine. Restore it, keep it, enjoy it. Get new rings. And be sure they're Hastings—the only rings engineered exclusively for replacement service in your car. Truly the best money you can spend on your car.

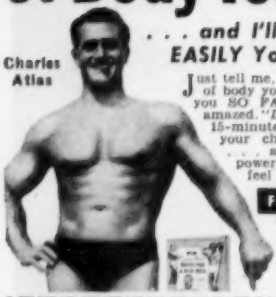
HASTINGS MANUFACTURING CO. • HASTINGS, MICH.
Piston Rings, Casite, Wear Reducer, Oil Filters, Spark Plugs

HASTINGS Piston Rings

TOUGH but oh so Gentle

TOUGH on oil-pumping • **GENTLE** on cylinder walls

Check the Kind of Body You Want



Charles Atlas

. . . and I'll Show You How EASILY You Can Have It!

Just tell me, in coupon below, the kind of body you want—and I'll give it to you SO FAST your friends will be amazed. *"Dynamic Tension,"* my easy, 15-minutes-a-day method, will make your chest and shoulders bulge . . . arms and legs surge with power . . . your whole body feel "alive!"

FREE BOOK Learn how I became "World's Most Perfectly Developed Man"—Mail coupon! CHARLES ATLAS, Dept. 1-J, 115 East 23rd Street, New York City 10, N. Y.

CHARLES ATLAS, Dept. 1-J,
115 East 23rd St., New York 10, N. Y.
Dear Charles Atlas: Here's the Kind of Body I want!
(Check as many as you like)

☐ More Weight—Solid—in the Right Places ☐ Powerful Arms, Legs, Grip
☐ Broader Chest, Shoulders ☐ Slimmer Waist, Hips ☐ Better Sleep. More Energy

Send me absolutely FREE a copy of your famous book showing how "Dynamic Tension" can make me a new man—32 pages, crammed with photographs, answers to vital questions, and valuable advice. No obligation.

NAME _____ AGE _____
(please print or write plainly)
ADDRESS _____
CITY _____ STATE _____

TURN BLACK ASPHALT INTO YELLOW GOLD !

MAKE UP TO $100 PER DAY IN A BUSINESS OF YOUR OWN!

You can start your own big profit paving business. Cash in on the tremendous demand in this fast growing field. The General Giant heavy duty, power operated roller lets you pave asphalt driveways and walks, parking lots, service stations. Roll lawns, tennis courts, playgrounds, parks and municipal properties. Your customers are everywhere. Home owners, builders, contractors, landscapers. This is a real professional contractor's roller that enables you to take ANY JOB — time tested and job proven — built to take a beating and withstand years of rugged service. Wonderful new automatic transmission with full reverse gives you complete maneuverability in tight spaces. Simple, foolproof adjustable weight control lets you roll anything from blacktop driveways to highways with equal ease. With your roller you get full operating instructions and complete accessories — everything you need to get started the day your equipment arrives. This is a once-in-a-lifetime opportunity for men with an eye to the future and small capital to get into a booming, high paying business. Don't delay — get rolling right away. Write for free, fully illustrated details.

OUR HELPING HAND

You can call on us at any time. Our engineering department is always at your service. We show you how to enter this booming business. Whether you can work full or part time, we supply the know-how and equipment that spells big profits. Don't delay. Act now. Write for full details.

J. H. from N. Y. writes, "What a money maker this is! I'm loaded down with jobs. Working with a new housing developer — have all the driveways and patios—140 of them!"

DEALERS WANTED!

GENERAL ENGINES COMPANY
Dept. T-97, Route 130, Therefore, N. J.

66,000 CANDLEPOWER

World's biggest & most powerful flashlight

USES HI-VOLTAGE—LESS AMPERES

More volts forced thru spec filament creates fireball brilliance with less ampere drain. Batteries last twice longer. Spot beam bullseye

New Ray Condenser
Bounces lost rays back into beam. Shields eyes. Giant die cast diamond facet reflector

Sealed Beam
Spec exclusive bulb uses 2 glasses for cooling & extra brilliance. Permanent bullseye focus

LONG RANGE SIGNAL
Used in forest towers & on water for emergency signal 15 miles or more. Ideal boat lite & for night hunting, vacation, camping. No light even half the power. Unique engineering, custom made. Order by mail.

5 Cell . . . . . **$4.99** 7 Cell **$5.99**
Deluxe Golden **$5.99** Deluxe Golden **$6.99**
Add 35c ea. shipping costs. Ex Bulbs 5 for $1
Giant Batteries 25c ea. Reg type 20c
Ex Reflectors 1.49 Shoulder sling 1.49
Money back guarantee if not more than satisfied.

DOG SUPPLY HOUSE, DEPT. 43-P
18440 Grand River Detroit 23, Mich.

on any object ELECTROPLATE

ANY OBJECT IN HOME, SHOP, GARAGE.

NOW with our **NEW ELECTROCHEMICAL** Outfit. You can easily do your own plating. Not a paint. But a hard durable metal plate, equal to commercial plating. Get your own plating kit with instructions on plating metal and non-metal objects as Tools, Auto Parts, Silverware, Jewelry, Rake, Shoes and 1001 other articles with **Chrome, Nickel, Copper, Gold, etc. SEND NO MONEY.** Everything sent C. O. D. for the low price of ONLY $5.95 or send $5.95 now and receive it postpaid. Money back in 7 days if not satisfied. **M.Z. SALES CO.,** Dept. H-12, 113 West 42nd St., New York 36, N. Y.

Official SEA, AIR & LAND PHOTOS

SPECIAL INTRODUCTORY OFFER!

1. 4-3½x5 Carrier, Subs and Battleships
2. 4-3½x5 World War II planes
3. 4-3½x5 photos, world's fastest jets
4. 1-8x10 photo, Forrestal Carrier
5. 1-8x10 photo USN F11F-1 Tiger

Only 25¢ a set. Send $1 for all 5. ($2 value)
Illust. CAT. with order. Money back guar.

U. S. SEA & AIR PHOTOS
DEPT SP BOX 75084
LOS ANGELES 5, CALIFORNIA

OVERLOAD SPRINGS

$11.95 Per Pair postpaid

2000 LB. SIZE $14.95

For cars and trucks. Front or rear. Gives 2000 lbs. extra capacity for all ½, ¾, and 1 ton trucks; 500 or 1000 lbs. extra for all cars. Easily installed. Guaranteed. State make, model, and year.

BRINKMAN MANUFACTURING CO.
5401 W. 21st Dept. 697 Topeka, Kansas

When Writing to Advertisers
Please Mention Popular Science

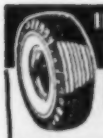
CONVERT YOUR CAR INTO A BED

Save on Overnight Trips—Rest In Solid Comfort

QUICK, EASY CONVERSION

Works on all 2 and 4-door sedans, club coupes, convertibles, station wagons. Fits all Ford, GM, Chrysler & Studebaker products —does not affect seat structure—normal functions or appearance. GUARANTEED to work when installed by instructions. PAYS FOR ITSELF in three nights lodging. Ideal for hunters, fishermen and travelers. Delighted users everywhere! Complete conversion kit and instructions **$19.95**

State make, model, whether 2 or 4-door
See your local dealer or
SEND CASH, CHECK OR MONEY ORDER TO:
CAR BED CO. 600 MAGNOLIA AVE., PANAMA CITY, FLA.



INSURED TIRE SERVICE POPULAR BRANDS

SPECIAL! Deduct 10% on orders for Two or More used tires

FREE INSURANCE POLICY given with each used tire sold. We guarantee the amount of service you pay for.

NOWHERE CAN SUCH QUALITY BE FOUND AT SUCH LOW PRICE!

YOU CAN'T LOSE!!

Super Quality — Rugged Performance — 6 Months Insured Service							
600x16	$3.65	670x15	$3.95	700x16	$4.45	760x16	$4.75
650x15	3.85	670x16	4.05	710x15	4.35	820x15	4.95
650x16	4.25	700x15	3.95	760x15	4.45	550x17	4.65

Supreme Quality—Nothing Finer—12 Months Insured Service							
600x16	$5.25	475x19	$8.45	700x15(6)	$10.45	700x20	$12.50
600x16(6)	6.75	640x15	4.95	750x16(8)	15.95	750x20(8)	15.50
650x16	5.75	670x15	5.35	700x17	11.95	750x20(10)	17.50
650x16(6)	7.25	710x15	5.45	750x17	16.45	825x20	21.50
700x16	6.35	760x15	5.95	750x18	10.95	900x20	19.95
750x16(6)	8.45	800x15	6.35	30x5	11.25	1000x20	20.45
550x18	4.95	820x15	6.35	900x20	10.95	1100x20	21.25
550x17	4.75	550x15	5.35	950x20	11.75	1000x22	21.95
650x15	5.25	670x16	5.15	32x6(8)	11.95	1100x22	22.75
700x15	5.35	700x16(6)	10.25	32x6(10)	12.75	1100x24	25.95

Whitewalls $1.00 extra.

MIDLAND TIRE SALES

Speedy shipments on Mail Orders. F.O.B. Chicago. Insurance policy sent with each order. Deduct 10% on orders for 2 or more used tires. Send CHECK or MONEY ORDER.—No COD's.
3701 S. Normal, Dept. 55-59, Chicago 9, Ill.

OWN a BUSINESS!

Earn $8,750.00 your First Year!

Start part time if you wish. We locally train you, furnish everything to clean and mothproof rugs, upholstery *on location* by world-wide process. Quickly established. No shop needed. Just 2 average jobs a day bring $8,750 net profit in year. Employ others and *multiply* profits. You get National Advertising, Parents' Seal, 25 other regular services. Easy terms. Send today for *free* booklets.

DURACLEAN CO., 7-189 Duraclean Bldg., Deerfield, Ill.

STUDY TO BE A DOCTOR

of Psychology or Metaphysics

Obtain a Ph.D., Ma.D., or Ph.D. Be a Teacher, Lecturer or Accredited Practitioner. Teach others how to achieve Health, Happiness and Contentment. Chartered by State. Correspondence courses only. Write for FREE book telling how.

THE NEOTARIAN FELLOWSHIP

Desk 5, Pickwick Building — Kansas City 6, Missouri

MARKSMAN AIR PISTOL

A hard-hitting, extra powerful air pistol that muzzle loads and cocks like a real 45 automatic. **All-metal** construction gives weight and "feel" of real gun. Shoots .177 caliber BB's, pellets and darts with amazing accuracy. Set complete with 3 kinds ammunition, targets and guarantee. At your sporting goods or hardware dealer!

MORTON H. HARRIS, INC. LOS ANGELES 28, CALIF.

A POSTCARD CAN PUT YOU IN A FINE BUSINESS!

Rush Card TODAY for FREE OUTFIT!

Get into highly profitable, repeat-order shoe business! Sell new line of Air-Cushion comfort shoes to friends, neighbors, folks at work! Over 210 dress, sport, work, safety shoe styles for men, women. Never sold by stores. Just 2 easy orders a day—in spare time—bring you $217 **extra** income a month! No investment. Rush name and address TODAY for FREE SELLING OUTFIT!

MASON SHOE, Dept. 790 Chippewa Falls, Wis.

Make $5 an Hour CASH PROFIT

THE DAY YOU START!

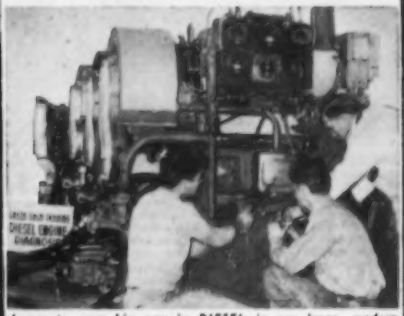
Start your own business at Home... Sharpen Household, Garden and Shop Tools in Spare Time.

Turn spare time into Big Cash Profits with new Belsaw Sharp-All. No experience needed to sharpen knives, scissors, shears, ice skates, mower blades, hedge trimmers, axes, chisels and circular saws . . . Learn how easily you can start your own spare time business. Amazing low cost easy-payment plan. Send Postcard for **FREE BOOK.**

BELSAW SHARP-ALL CO 708 Field Bldg., Kansas City 11, Mo.

DIESEL

MECHANICS IN DEMAND



Learn to earn big pay in DIESEL in our large, modern equipped Chicago school and shop. No previous experience or training necessary. We help you find living quarters and part time job while in school. Complete, practical courses taught in the following trades, under the supervision of experienced, expert technicians.

APPROVED FOR CIVILIANS ☐ OR GI'S ☐

—CHOOSE YOUR TRADE—

CHECK HERE	WEEKS
☐ DIESEL MECHANICS	20
☐ AUTO MECHANICS	20
☐ BODY & FENDER	16⅔
☐ GAS-ARC WELDING	4-12
☐ REFRIGERATION	13⅓
☐ AIR CONDITIONING	8⅓
☐ MACHINIST TRADE	30
☐ ADVANCED MACHINIST (includes tool & die)	32⅓
☐ PIANO TUNING & REPAIR	36

CHOOSE YOUR ENGINEERING COURSE

These courses are intended as terminal education for men who wish to enter the Diesel-Automotive and Refrigeration-Air Conditioning fields as technicians. These courses are designed to prepare men for supervisory positions. Students with a high school education, or equivalent, will be accepted.

☐ DIESEL AUTOMOTIVE ENGINEERING ..... 2 years
☐ REFRIGERATION & AIR COND. ENGINEERING ..... 18 months

☐ HEAVY CONSTRUCTION EQUIPMENT OPERATORS TRAINING SCHOOL FOR CIVILIANS—Road Building, Terracing, Land Clearing, etc. Reservations accepted now!

FREE EMPLOYMENT HELP

Start your career with Greer by checking your interest above and mail coupon for complete information at no obligation.

NAME _____ AGE _____

STREET _____

TOWN _____ ZONE _____ STATE _____

Established 1902—Over 80,000 Graduates
55 years of continuous trade school experience to guide your training.

GREER SHOP TRAINING

Box I, 2238 S. Michigan Ave. Chicago 16, Illinois

LEARN

Television

RADIO-COLOR-TV

In the great shops of COYNE

Great opportunity for a good job or your own business in one of America's fastest growing industries! New stations . . . new sets by the millions . . . Color TV . . . all means greater opportunities.

Veterans and Non-Veterans—Get practical shop work plus technical training in TELEVISION—RADIO at Coyne in Chicago—old established school—training background nearly 60 years.

Learn on real equipment—no advanced education or previous experience needed. Lifetime employment service to graduates.

Finance Plan—New liberalized credit terms. Enroll now, pay most of tuition later. Part time employment help to students.

BIG FREE BOOK Mail coupon. No obligation. No salesman will call. Act NOW.

COYNE ELECTRICAL SCHOOL

CHARTERED NOT FOR PROFIT
Established 1899
500 S. Paulina, Chicago, Dept. 67-4H

COYNE Electrical School
500 S. Paulina St., Chicago 12, Ill., Dept. 67-4H

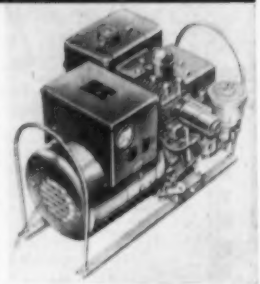
Send FREE BOOK and details of your training in TV-RADIO

Name_____

Address_____

City_____ State_____

Brand New! Portable Light Plants



WITH PUSH BUTTON STARTER. Be prepared for power failures! Provides plenty of current for receivers, transmitters, antenna motors, emergency lights, etc. Perfect for radio hams, civil defense, trailers and camps. 700 Watts-115 v., 60 cyc., AC. Powered by rugged 2.2 H.P., 4 cyc., Briggs-Stratton or Clinton gas engine. No wiring necessary, just plug in and operate. Complete with tote handle, voltmeter and built-in winding for charging 6 v., auto battery. Only generator at this low price with radio shielding! Easily handles any appliance that requires up to 700 watts. (A76). Shpg. wt. 77 lbs..... **$143.50**

1200 Watts (A126). Wt. 90 lbs. Same as above but larger engine & generator, more capacity **$195.50**

2500 Watts (A256). Wt. 225 lbs. Similar to above, bigger, heavier and developes more power **$325.50**

MONEY BACK GUARANTEE.....ORDER TODAY!

GENERAL ELECTRONIC SERVICE CO.

P. O. Box 9 Dept. PS-9 Burlington, Wisconsin

FIBERGLAS DUCK AND LIGHT FISHING BOAT

$168.00

F.O.B. Waseca, Minn.

- Made in off season to give year round employment. Guaranteed sold at less than wholesale price.
- Fiberglas with duraluminum keel. 5 times strength of steel.
- No wood. Leave out year around.
- 13 ft., wgt. 120 lbs. Takes up to 10 hp. motor. Rows well.

Write for Catalog No. IAFW

HERTER'S • SINCE 1893 • WASECA, MINNESOTA

WHAMO'S *Malayan* THROWING DAGGER

BALANCED TO STICK! *special* $1.35

MALAYAN HUNTING KNIFE used for killing game. Exciting target sport. Easy to learn! Fun indoors or outdoors!

EASY TO THROW!

Fun, Thrills, Excitement

Learn this Sport! Easy to throw accurately with our clear instructions. Beautiful, heavy-duty 12" knife. Tempered steel. Tough, rawhide-bound handle. Rare souvenir, unusual bargain. At sports dealers or send $1.35 (3 for $3.98)

WAMO MFG. CO., Box 15-B San Gabriel, Calif.

NEW!

BUILD MUSCLES & HEALTH with BODY BUILDER

Only **$1.00** Postpaid

This new Chest Pull Body Builder develops powerful he-man muscles F.A.S.T. Ideal for the beginner to give him a real start in championship muscularity and perfect for the more advanced bodybuilder to combine with his regular training for faster, all around muscle growth. Body Builder is wonderful for developing massive arms, shoulders, chest and back. Mail your order today. Only $1.00 postpaid. No C.O.D.

MEDFORD PRODUCTS, Inc.
Dept. P.S. 9, P.O. Box 39, Bethpage, New York

WE PAY $3.50 lb. dried

GROW MUSHROOMS. Cellar, shed and outdoors. Spare or full time, year round. We have over 25,000 customers. FREE BOOK. Washington Mushroom Ind., Dept. 62, 2954 Admiral Way, Seattle, Wash.

POKER DICE

Poker Dice is played just like the card game, except that you roll the cubes. High hand wins on the first roll, or if you like draw poker, you roll 'em a second time. Dice are standard size cubes with playing card symbols embossed in red and black. An exciting party game. Only $1.00 postpaid from: **GRIFFIN PRODUCTS, 1170 Broadway, Dept. PP, New York 1, N. Y.**

COMPLETE NEW **FALSE PLATE** IN 24 HOURS

Send No Money —Just rush name and address for full free details. If your teeth are loose, we'll tell you how to tighten them. ACT TODAY.

FROM YOUR OLD $15.95
NOW LOW AS.....

New process transforms old, broken or loose plates into new lightweight plastic plates. NO IMPRESSION NEEDED. Let us help you enjoy life again. You will marvel at this revolutionary new method. Using your own old plates, we will remake them completely in only 24 hours. Missing teeth carefully matched and replaced. Work done on absolute *Money Back Guarantee.*

TRU-GRIP DENTAL LABS., 127 N. Dearborn, Dept. UU, Chicago 2, Ill.

Model 99-F Featherweight . . . $116.75
Model 99-EG $113.65
Model 99-R $116.75

inside story on the Savage 99

lever action big game rifle

Exclusive rotary magazine and action are fully enclosed . . . loads and unloads quickly, easily . . . cartridges protected from dirt and moisture . . . balance the same no matter how many rounds in magazine. Unique cartridge count indicator shows number of cartridges in magazine . . . safety indicator tells instantly by sight or touch whether hammer is cocked.

Available in 3 great models (each drilled and tapped for popular receiver and 'scope mounts) and 5 great calibers: .250-3000 Savage, .300 Savage, .243 Win., .308 Win. and .358 Win.

There are Savage, Stevens and Fox shotguns and rifles for every shooter and every kind of shooting. *Write for free rifle or shotgun catalog. Savage Arms Corporation, Chicopee Falls 15A, Mass.*

all prices subject to change slightly higher in Canada

Savage TRADEMARK

SAVAGE · STEVENS · FOX FIREARMS

LEARN • EARN MORE MONEY UPHOLSTERY

YOU'RE IN BUSINESS RIGHT OFF—Complete upholsterer's tools, materials, frames, all you need to earn in sparetime while your learn **AT HOME.** Expert N. Y. State approved shop training in upholstery, slip covers, etc. Big Opportunity Field. Send for FREE Illust. Catalog, FREE Sample Lesson. Write Today. **Approved for Vets.**

Upholstery Trades School, Dept. FO-1612, 721 Broadway, New York 3, N.Y.

Stop Pushing Doorbells!

SELL MASTER UNIFORMS TO BUSINESS MEN

—and make up to $50 in a day!

Say "goodbye" to tiresome, unprofitable house-to-house canvassing! Sell in **volume** to business men and pocket **volume profits fast!** Customers buy from 1 to 100 uniforms for employees all at one time! You make big money **on the spot!** You'll cash in big, because your line of attractive, well-made Master **advertising uniforms** builds company pride and prestige. Company name or trademark is embroidered right on uniforms—employees become "walking advertisements" of tremendous value to the firm. That's why your prospects buy **fast . . . in volume**. . . again and again! Your profits zoom to new heights in a hurry! And you never invest one cent. We carry the stock; we ship and collect. All you do is show the line and take **Big Profit** orders! Rush coupon now to get—FREE—your powerful Sample Outfit that has everything you need to start making big money right away!

GEO. MASTER GARMENT CO., Dept. C-17
Ligonier, Indiana

You bet I want to make up to $50 in a day selling Master Advertising Uniforms to business men! Rush my FREE profit-packed Sample Outfit right away!

NAME _____

ADDRESS _____

TOWN _____ STATE _____

PREPARE FOR BETTER JOB, BIGGER PAY IN SPARE TIME AT HOME

Today, choose the job you want—and prepare for it in time you might otherwise waste. Or if you are already in the work you like best, start training now for quicker promotion and increased pay. During the past 60 years AMERICAN SCHOOL has helped ambitious people to reach higher goals. Check subject that interests you and mail coupon for full information.

Without obligation, please send FREE and postpaid, full particulars about the subject checked below.

AMERICAN SCHOOL, Dept. G646, Drexel at 58th, Chicago 37, Ill.

- ☐ Accounting
- ☐ Apprenticeship Courses
- ☐ Architecture & Building
- ☐ Automotive Technician
- ☐ Better Penmanship
- ☐ Blueprint Reading
- ☐ Bookkeeping
- ☐ Business Management
- ☐ Civil Engineering
- ☐ Contracting
- ☐ Diesel Technician
- ☐ Drafting—Building Trades
- ☐ Drafting—Machine Trades
- ☐ Electrical Engineering
- ☐ Electricity—Practical
- ☐ Electronics—Industrial
- ☐ HIGH SCHOOL COURSES
- ☐ Machinists
- ☐ Mechanical Engineering
- ☐ Mechanical Technology
- ☐ Metalworking Courses
- ☐ Plumbing—Practical
- ☐ Private Secretary
- ☐ Retail Merchandising
- ☐ Salesmanship—Outside
- ☐ Sheet Metal Work
- ☐ Tool Making

NAME ..... OCCUPATION .....

HOME ADDRESS ..... AGE .....

CITY ..... STATE .....

Conditions: Write American School, Dept. G646, 6083 Sherbrooke St. W., Montreal

MAIL COUPON NOW

"We'll be using them for years...

...that's why we pick the Brand that's made a Name for itself!"

EVERYTHING that goes into a new house takes a big bite out of the family budget. And it's all too true that you have to live with mistakes you make in buying . . . whether they be appliances, furniture, food, clothing or whatever. So buy brands that have made a name for themselves. You're bound to be satisfied.

FOUR WAYS BRAND NAMES SATISFY YOU MOST

1. BUY WITH TRUST!
Spend *confidently* on known quality. Brand Names wear best, work best, taste best, are best.

2. SHOP WITH EASE!
Spend *efficiently* on proved value. Brand Names save time "puzzling" over labels, models, prices, etc.

3. ENJOY MORE CHOICE!
Spend *shrewdly* among widest selections. Brand Names offer the most in sizes, types, colors, flavors, etc.

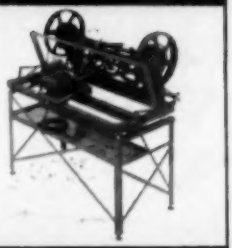
4. GET THE "LATEST"!
Spend *smartly* on up-to-date products. Brand Names keep improving, modernizing, introducing new things.

Advertisers in this magazine are good names to know. They're proud of their brands 'cause they satisfy so.

BRAND NAMES FOUNDATION, INC. • 37 Fifth Avenue • New York 16, N. Y.

MODERN IMPROVED LAWN MOWER SHARPENER AND BED KNIFE GRINDER

Sharpen any mower in 10 to 20 minutes. Hand—Power—Reel or Rotary. Modern is actually two machines in one, a Precision Bed Knife Sharpener and a Precision Reel Sharpener. Extra Bed Knife Grinder is Absolutely Unnecessary. New Mower Support makes it possible to sharpen reel without removing bed knife. The fastest precision lawn mower sharpener on the market. Costs Less. Compare Modern's Many - Exclusive Features Before Buying. Send for Free Brochure No. 11 SN



MODERN MANUFACTURING CO.
160 North Fair Oaks Ave., Pasadena, California

BE A LOCKSMITH

Learn fascinating, profitable trade from experts in spare time at home! Age or physical handicap no disadvantage. Year around, steady income. Full or part time. Practical, illustrated lessons. Make money even while learning! All materials & special tools supplied.

Learn at Home
Free Booklet

LOCKSMITHING INSTITUTE, Dept. PS-93
15 PARK AVENUE RUTHERFORD, N. J.
Lic. by N. J. State Board of Ed. Approved for Vets

MEN WANTED

Earn $100 Per Week and up
AUTO DIESEL MECHANICS

Master a trade with a future—learn Auto-Diesel mechanics in our shops. You learn with tools on real equipment. Earn while you learn. Many of our graduates earn $100 per week and up. No previous experience necessary. Day and night courses. Approved for veterans. Write for free bulletin.

NASHVILLE AUTO-DIESEL COLLEGE
226 7th Ave., N., Dept. 41 Nashville 3, Tenn.

FULL SIZE MODEL KITS!

$5.95

The original kit.

Now 9 authentic models for den or game room. Wood with machine work done for you. Process for gun metal finish. Order direct or send 15¢ for interesting, revised catalog.

Army "A"
Civilian "B" Kit $5.95
FBI .357 Magnum 4.00

For NEW illustrated catalog of 9 models. Send 15¢ to:

O'BRIEN GUNCRAFT (D) P.O. BOX 657 MADISON WIS

ONLY $399 Freight included FREE FOLDERS

NEW 18 ft. OFFSHORE CRUISER KIT

17 Models as low as $42.00 (freight included). Fiberglass boat covering kits, marine supplies, etc.

Tops and side curtains available!

TAFT MARINE WOODCRAFT
Dept. PS-957 636 29th Ave. N. E. • Minneapolis 21, Minn.

FREE OUTFIT STARTS YOU IN BIG MONEY SHOE BUSINESS!

Run your own profitable 'shoe store' business **from home!** Represent fast growing million dollar firm in spare or full time. We give you—**FREE**—complete Starting Outfit that makes you **$217.00 EXTRA each month for just 2 easy orders a day.** You feature 195 fast-selling dress, sport, work shoe styles for men and women. Air-cushion shoes, many other special features! Sizes 2½-15—widths AAAA to EEEE. Draw on 200,000 pair stock. Also horsehide jackets. Start now selling to friends, folks where you work. Rush postcard for FREE Outfit!

MASON SHOE, Dept. 789, CHIPPEWA FALLS, WIS.

ONLY $75 DOWN

for today's best buy in fun-filled transportation

Ride to work or play on a

HARLEY-DAVIDSON

HUMMER

New liberal purchase plans — After minimum down payment, monthly instalments average only $18.74 for vehicle, property and liability insurance and carrying charges.

Operating costs as little as 35¢ for 100 miles of travel. Maintenance and depreciation costs are negligible when compared with other forms of transportation.

Beat traffic worries — There's plenty of room to breeze between crawling or standing lanes of traffic, get up front ahead of the crowd. No parking problems either! Enjoy traveling the Harley-Davidson way — money-wise, pleasure-wise.

Good deals on other new and used models too—Visit your dealer for a trial ride and details. Or, write us for free literature.

HARLEY-DAVIDSON MOTOR CO.
DEPT. PS • MILWAUKEE 1, WISCONSIN

PELLET FIRING "45" CAL. AUTOMATIC

Magazine Loading Ammunition Clip — Has Automatic Slide Action — Over 15 Moving Parts

$1.00

Fires 8 Rounds

An automatic full size model of a high powered "45" caliber automatic pistol that looks and feels just like the real thing and contains over 15 moving parts. Loads 8 complete rounds in the magazine clip which snaps into the hard butt just like an army "45". Then fires 8 bullet-like pellets as fast as you can pull the trigger. You've got to see the automatic slide action and feel the power to believe it! Great for shooting fun. This is the most authentic model gun we've ever seen.

Learn the Working Mechanism of a "45"

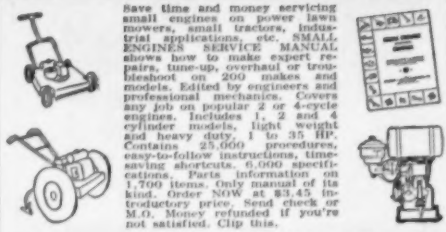
This accurate, model of a high powered "45" comes to you disassembled with all the working parts of a "45". It assembles in a jiffy and full instructions are included so that in no time at all you'll learn working parts of an automatic. Comes with instructions, full supply of pellets and man-sized silhouette target.

10 Day Free Trial

Try it for 10 days free. If you are not 100% delighted simply return after 10 days for prompt refund of full purchase price. Don't delay! Order now! Simply send $1 plus 25c shipping charge to:

HONOR HOUSE PRODUCTS Dept. PP-60
LYNBROOK, N. Y.

HOW TO FIX ANY AIR COOLED ENGINE!



Save time and money servicing small engines on power lawn mowers, small tractors, industrial applications, etc. SMALL ENGINES SERVICE MANUAL shows how to make expert repairs, tune-up, overhaul or troubleshoot on 200 makes and models. Edited by engineers and professional mechanics. Covers any job on popular 2 or 4-cycle engines. Includes 1, 2 and 4 cylinder models, light weight and heavy duty, 1 to 35 HP. Contains 25,000 procedures, easy-to-follow instructions, time-saving shortcuts, 6,000 specifications. Parts information on 1,700 items. Only manual of its kind. Order NOW at $3.45 introductory price. Send check or M.O. Money refunded if you're not satisfied. Clip this.

SMALL ENGINES SERVICE MANUAL 1014 Wyandotte Street Dept. A, Kansas City 5, Mo.

Mr. "N" Made $9,700 Last Year By Selling Just 20 KEEP/SAFES a Month!

Like Mr. "N" you can profit with KEEP/SAFE —the fine personal safe that undersells all others. Only safe sold direct. 95% of homes, farms and small businesses are prospects. $30 to $71 profit per sale, **plus** bonuses up to $12 a safe. Choice territory chance to become district agent. **FREE DEMONSTRATOR!** Get details, giving address, including county.

John D. Brush & Co., Inc., 577 West Ave., Rochester 11, N. Y.

BUY FAMOUS BRANDS WHOLESALE!

- APPLIANCES
- WATCHES
- TYPEWRITERS
- HOUSEWARES
- SPORTING GOODS
- CAMERAS
- CLOTHING
- JEWELRY
- TOOLS
- GIFTS

DISCOUNTS UP TO 80%

All brand new, nationally advertised merchandise. Guaranteed. Huge savings

Send Postcard For Free Details

MIDWEST SALES (CM-156) Pontiac, Illinois

Now: GET LONGER LIFE FOR YOUR BATTERY

Amazing "NEW LIFE" battery rejuvenator extends useful life of new or old batteries for many months. Use lights, heater, radio as much as you like. Get sure starts even in zero weather. NO RECHARGING NECESSARY!

Money Back Guarantee. Use 1 box for 6 volt, 2 boxes for 12 volt batteries. Rush only $1.00 per box.

JSM PRODUCTS CO. 1118 CASTLETON RD., DEPT. 67 CLEVELAND 21, OHIO

$388.31 "Brikodier" Available, $15.00 B-16

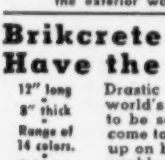
*National average. May vary by locality

Above low price buys all the Brikcrete needed for the exterior walls (8" thick) of the "Brikodier".

Brikcrete Manufacturers Have the Price Advantage

12" long • 8" thick • Range of 14 colors. • Suited to every type of building. • Self-contained insulation values.

Drastic economies in production enable the world's most modern and practical masonry to be sold so low, yet return a generous income to the local manufacturer — 100% markup on basic costs. Building owners get more usable value per dollar — plant operators profit from constantly expanding sales volume. Brikcrete production is a community enterprise — processing local materials for local building activities. Plants operate in franchise-protected territories, with Brikcrete machine available on lease. Write for Brikcrete Book No. 2.



BRIKCRETE ASSOCIATES, INC.
422 W. 25th Street, Holland, Mich.
802 Dundas H'way, Cooksville, Ontario

RUPTURE

RELIEF...OR YOUR MONEY BACK

Write now for free booklet and pictures of rupture care. You can be helped...work steady, with low cost, easy to wear Web Truss, thousands satisfied.

WEB TRUSS CO. Dept. PS-9. Hagerstown, Maryland

2 WAY PORTABLE RADIO SET!

SENDS—RECEIVES UP TO 10 MILES AS SHOWN

with built-in antenna or hundreds of miles with outside antenna! 80 and 40 meter amateur radio bands (novice) also Aircraft and overseas broadcasts (3 to 5 mc.) PORTABLE SELF-CONTAINED POWERED WITH STANDARD LONG LIFE, PORTABLE RADIO BATTERIES. NO AC PLUG-INS NEEDED! Take it with you everywhere you go—on trips, vacations, camping—Keep in contact with home, friends. Has 5 watt crystal controlled transmitter—Sensitive Regenerative Receiver. Send-receive switch. 8¾, only 3 lbs. Size, only 6"x4"x4". TESTED—PROVEN—SIMPLIFIED—PRACTICAL—Full information given on quick easy to get license.

SEND ONLY $3.00 (bill, ck, mo) and pay postman $11.95 COD postage on arrival or send $14.95 for postpaid delivery. Complete kit includes all parts, tubes, coils, plastoid cabinet, easy instructions. (Set of batteries—$2.95, crystal $1.25). COMPLETELY WIRED AND TESTED POSTPAID $19.95. A regular $49.95 value—Order now before price goes up.

GUARANTEED—AVAILABLE ONLY FROM:

WESTERN RADIO, Dept. BNS-9, KEARNEY, NEBR.

NEW RUBBER STAMP BUSINESS PAYS BEGINNERS UP TO $9.20 AN HR.

START AT HOME IN SPARE TIME with Table Top Machine!

The multi-million dollar Rubber Stamp business—once controlled by a few big companies—is now being taken over by small operators—one in each community throughout the United States. Men and Women who have this inexpensive machine can turn out huge quantities of Rubber Stamps with special wording that buyers once were forced to buy from big cities. Material costing only 27c makes a stamp that sells for $1.80. The machine that does the work is simple and easy to operate and it turns out as many as six Rubber Stamps at a time, each with different wording such as names, addresses, notices, stock numbers, prices and other "copy" needed by offices, factories and individuals. Working full capacity, it can earn as much as **$9.20 an hour for the operator!** Now you can get into the big-pay business yourself, with your own home as headquarters. You don't need experience. We supply everything, including complete instructions and eight ways to get business coming in fast. Start making up to $9.20 an hour from the very beginning. Cash in on the profitable Rubber Stamp business in your community, right away. We'll mail full particulars FREE and no salesman will call. Be first in your locality. Rush coupon today or send your name on postcard to

RUBBER STAMP DIV., Dept. R-3-K
1512 JARVIS AVENUE • CHICAGO 26, ILLINOIS

RUBBER STAMP DIV.
1512 Jarvis Ave., Dept. R-3-K
Chicago 26, Illinois

FREE!

Please rush full particulars about the little machine that can get me started in the profitable Rubber Stamp business at home in spare time. Everything you send me is FREE and no salesman will call.

NAME .....

ADDRESS .....

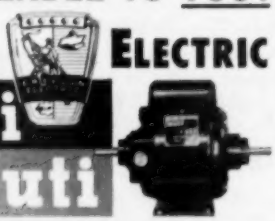
CITY ..... ZONE ..... STATE .....

PREFERRED

by Leading Appliance Manufacturers

NOW AVAILABLE TO YOU!

EMERSON ELECTRIC



MOTORS

First choice of manufacturers for 67 years! Now you can choose from 21 different designs from ¼ to 1 H.P. Write for free catalog No. M-142. The Emerson Electric Mfg. Co., St. Louis 21, Mo.

EMERSON-ELECTRIC

of St. Louis . . . Since 1890

ENGINEERING

Photo of Heald Electrical Laboratory

Enroll Now for New Term

Heald College Ranks FIRST West of the Mississippi in "Who's Who" in America

Send for FREE Information

Heald Engineering College
Est. 1863
Van Ness at Post, Dept. PS957
San Francisco, California

Thousands of Engineers Needed for Hard Pressed Industry

BACHELOR OF SCIENCE DEGREE, 27 MONTHS

Degree Courses:
- ☐ Electronic Engineering
- ☐ Electrical Engineering
- ☐ Highway Engineering
- ☐ Mechanical Engineering
- ☐ Structural Engineering
- ☐ Civil Engineering
- ☐ Architecture

Diploma Courses:
- ☐ TELEVISION ☐ Color TV
- ☐ Tool & Die Design
- ☐ Architectural Drafting
- ☐ Mechanical Drafting
- ☐ Structural Drafting
- ☐ Surveying
- ☐ Estimating
- ☐ Master Electrician

Approved for Veterans

NAME _____

STREET _____

CITY _____

STATE _____

Coming in October

Removable Bonus Booklet

"BEFORE YOU CALL THE TV REPAIRMAN" — *A dozen jam-packed pages with detailed steps on how to save money by doing your own minor TV repairs.* You'll learn how to recognize, analyze and fix a faded picture, weak signal, ghosts, interference, shrunken picture, vertical and horizontal distortion, off-center picture, etc. You'll learn how to recognize and cope with antenna troubles. You'll see which tubes to check, discover how some odors point to specific troubles. All this *plus* valuable safety tips and a trouble-shooting table that tells where to look for the trouble and what to do about it. You'll find this helpful, removable booklet bound right into your copy of October POPULAR SCIENCE.

All About Indoor Fireplaces

An eight-page picture-packed feature that'll help you decide which is the best fireplace for you—a prefab? masonry? circulating? Learn the advantages and disadvantages of each type . . . how to be sure it won't smoke . . . how much it will cost . . . the real low-down on factory-built chimneys . . . what you can get for as little as $100. PLUS special tips on how to cure a smoking fireplace, and pointers on building your own fireplace.

The Truth About Snow and Mud Tires

Will snow tires give you the added traction you need? Do they eliminate all need for chains? Do they wear out faster than regular tires? How should you pick them? Can you really get a "noiseless" snow tire? Are nylons or rayons a better buy? Are recapped snow tires a good buy? Get the answers to these questions and many more in October POPULAR SCIENCE.

Chrysler Unveils Two Mighty Engines for '58

Get the full report on how Chrysler gambled on a multi-million-dollar crash program, and came up with a winner: the brilliant new "B" engine. In two different versions, the "B" engine will power the '58 Plymouth Fury, Dodge Custom Royal, Dodge D500, and four De Sotos including the Firesweep. Chrysler engineers say that this engine has more radical new features than any previous engine in Chrysler history. For the full, exciting story be sure to see October POPULAR SCIENCE.

Get October Popular Science at all newsstands soon

MEN PAST 40

Troubled with GETTING UP NIGHTS, Pains in BACK, HIPS, LEGS, Tiredness Loss of Physical Vigor

If you have these symptoms then your troubles may be traced to Glandular Dysfunction . . . a constitutional disease. Medicines that give temporary relief will not remove the cause of your trouble. Neglect of Glandular Dysfunction often leads to premature old age and sometimes incurable malignancy.

The past few years men from over 3,000 communities have been successfully treated here at the Excelsior Institute. They have found soothing relief and a new health and zest in life.

The Excelsior Institute, devoted to the treatment of diseases peculiar to older men by **NON-SURGICAL** methods has a NEW FREE BOOK that tells how Glandular Dysfunction may be corrected by proven **NON-SURGICAL** treatments. This book may prove of utmost importance in your life. Write today. There is no obligation.

Excelsior Institute, Dept. B531, Excelsior Springs, Mo.

DRAW The First Day!

NO LESSONS! NO TALENT!

New Amazing Invention—"Magic Art Reproducer." You can draw Your Family, Friends, Anything from REAL LIFE—Like An Artist. Even If You CAN'T DRAW A Straight Line! Anything you want to draw is automatically seen on any sheet of paper thru the "Magic Art Reproducer." Then easily follow the lines of the "picture image" with a pencil for an original "professional looking" drawing. Also reduces or enlarges. SEND NO MONEY! Free 10 Day Trial! Pay Postman on delivery $1.98 plus postage. Or send only $1.98 with order and we pay postage. Money Back Guarantee.

NORTON PRODUCTS, Dept. 144, 296 Broadway, N. Y.

Buried gold—silver—metal objects

HIDDEN TREASURE!

...is easy to find with GOLDAK'S "FIND-IT"; a powerful 3½ lb. locator; only $64.50 complete with earphones, batteries and instructions. Write for FREE literature full line metal, mineral locators, geiger, scintillation counters.

GOLDAK CO., 1544-9 Glenoaks Blvd. Glendale, Calif.

FREE "How To Start Your Own MAIL ORDER BUSINESS"

Earn from $10,000 to $20,000 spare time. We'll put you in business and furnish you with everything needed. Exclusive new catalogs every three months . . . Offer your customers one item free for every two they buy! Free advertising and no stock for you to buy. We ship for you under your own name. No experience required. Write today for free booklet and franchise data.

MAIL ORDER ASSOCIATES ROCHELLE PARK 28, NEW JERSEY

ANTIQUE WEAPONS

Fascinating illustrations, descriptions and histories of guns, swords, daggers, armor, etc., yours in our newest Catalog #30. 140 pages, crammed with unusual items, from choices for beginning collectors to rare museum pieces. Catalog #30—send your name and address with 50c to:

ROBERT ABELS, Box P5, 860 Lexington Ave., New York 21, N. Y.

Genuine Dupont Plastic NEW FALSE PLATE

From Your Old, Loose Plate. NO IMPRESSIONS NEEDED. New, revolutionary Duplication System actually transforms your old, loose, cracked, chipped plate into a new, natural-pink Dupont Plastic Plate with same teeth or new, natural matched teeth. ONE DAY SERVICE!

Only $18.95

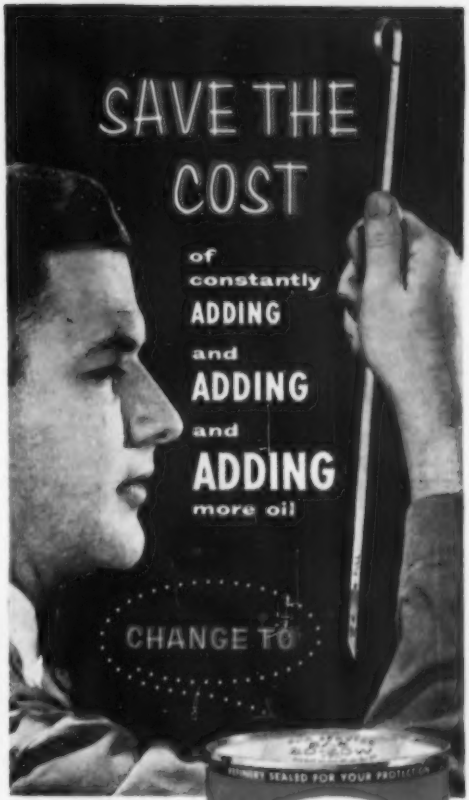
SEND NO MONEY—Just your name and address for FREE details. Save at our low price. Highest prices paid for Dental Gold.

30-DAY MONEY BACK TRIAL

FREE: 6 months' supply False Plate Cleaner to all who write for our money saving offer.

ALL STATE DENTAL LABORATORIES

22 W. Madison Dept. 146 Chicago 2



STOP

VALVE LIFTER STICKING

Protect the Engine Performance You Bought

Refined from 100% Bradford Pennsylvania Crude Oil—world's richest—by special Kendall processes and an exclusive additive formula.

The quality of Kendall, The 2000 Mile Oil can spell economy for you. It stops high oil consumption—ends valve lifter sticking. To keep your motor younger, longer, ask your favorite dealer for it now.

BY THE REFINER OF KENDALL SUPER8 MOTOR OIL

KENDALL REFINING COMPANY BRADFORD, PENNA.

avoid a costly mistake

in your high fidelity system

FREE

HI-FI BOOKLET

describes... the important advantages of playing your records on a precision turntable!

SEND COUPON TODAY!

PS

NAME _____

ADDRESS _____

CITY _____ ZONE _____ STATE _____

REK-O-KUT COMPANY, INC.

38-01 Queens Blvd., Long Island City 1, N. Y.

TRAINED MEN NEEDED!

IN INDUSTRY—ARMED FORCES

BIG PAY!—GOOD FUTURE!

☐ DIESEL ☐ ELECTRONICS

☐ AUTO ☐ AUTOMATION

NEVER BEFORE has the opportunity been so good for the properly trained mechanic and technician to step into BIG PAY POSITIONS with rapid advancement and future security virtually assured.

YOUR SUCCESS depends on the quality of training you receive . . . and the reputation of the school you attend.

YOUR GUARANTEE we are giving the best in mechanical and technical training is proved by the fact . . . High pay jobs in Industry, and ratings in the Armed Forces now waiting for our graduates.

RESIDENT SHOP TRAINING is easier and costs less than you may think! We provide you with housing and part-time jobs while in school, plus free nation-wide placement service for graduates.

Check subject above in which you are interested and mail for

FREE BOOKLET

Your Future in ELECTRONICS and AUTOMATION

BAILEY Technical Schools

Veteran Approved

1650 S. Grand, St. Louis 4, Mo.

Your Future in DIESEL and AUTO MECHANICS

Name _____ Age _____

Street _____

Town _____ Zone _____ State _____

---

24 YEARS AT THIS ADDRESS

"We Have No Rent to Pay." That is Why We Can Sell for Less

Our entire stock of very slightly worn EXTRA MILEAGE TOP GRADE Tires. Written Guarantee Sent. SEND AD

EVERYBODY MAY DEDUCT 10% off ON EVERY TIRE

Free—Tube With Each Passenger Tire

FREE If you buy 2 or more Passenger 4-ply tires, WE GIVE ONE tire FREE, on each order. Does not include W.W. or Truck Tires. Send Ad.

WHITE WALLS $1.00 EXTRA—12 MOS. WRITTEN GUARANTEE

600-16	$5.75	640-15	$5.75	700-15(6)	$8.95	700-20	$12.25
600-16(6)	6.65	670-15	5.75	750-16(8)	10.95	750-20(8)	12.95
650-16	5.75	710-15	5.75	700-17	10.85	825-20	19.55
650-16(6)	7.05	760-15	5.85	750-17	13.75	900-20	19.55
700-16	6.95	800-15	6.05	650-20	11.25	1000-20	19.95
750-16(6)	8.25	820-15	6.25	1100-22	21.75	1100-20	20.55
650-15	5.75	700-16(6)	8.95	1100-24	24.95	1000-22	20.75

"EXTRA SPECIAL" Fully Guaranteed all size 4-ply pass. FREE TIRE with 2 or more of these.—W. W. $1.00 Extra. Factory Tested Tube given. GIANT TIRE SALE $8.75

SNOW TIRES $8.95 ea. ORDER ANY 4 PLY PASSENGER SIZE BLACK WALL

Thousands of tires shipped all over the U.S.A. All tires shipped F.O.B. Phila. Send Check or M.O. with this ad. Dept. S. No C.O.D.

STANDARD 834 N. Broad St., Philadelphia 30, Pa.

---

75 POWER TELESCOPE 25X-45X-75X **$3.98**

New 3 in one telescopes, 3 variable 25X-45X-75X magnification. Brass bound. 25 power for ultra bright images 45 & 75 power for long range. Guaranteed to bring distant stars, moons, objects, sports 75 times closer. Most powerful scope sold anywhere near this amazing low price. American made, 5 sections. Opens 36" closes 1 ft; contains 4 ground & polished lenses. Can also be used as powerful compound microscope. Directions included. Mass production enables us to offer telescope complete at $3.98 ea. Rapid. Money back guarantee. Get yours now.

CRITERION CO., 331 Church St., Hartford, Conn., Dept. PSB-51

---

2 FOR $14.95

MAGNETO HANDSET INTER-COMM

(rebuilt). For house to barn etc., included 100 ft. of wire and 4 batteries. Additional wire .01c per ft. Any number can be connected in same line. Write for FREE List. All Shipments FOB Simpson, Pa.

TELEPHONE ENGINEERING CO.

Dept. 9A7 Simpson, Pa.

GETTING UP NIGHTS

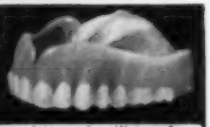
If worried by "Bladder Weakness" (Getting Up Nights or Bed Wetting, too frequent, burning or itching urination) or Strong Smelling, Cloudy Urine, due to common Kidney and Bladder Irritations, try CYSTEX for quick help. 30 years use prove safety for young and old. Ask druggist for CYSTEX under money-back guarantee. See how fast you improve.

---

help your HEART FUND help your HEART

NEW FALSE PLATE

FROM YOUR OLD ONE IN 18 HOURS



AS LOW AS $14.95

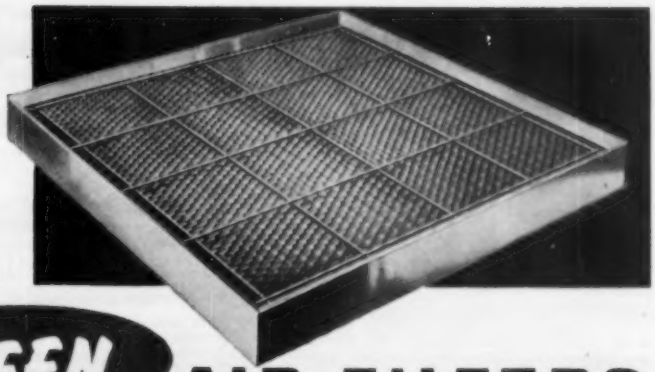
Send us your old broken, cracked or loose plates and we'll transform them into new lightweight wonder plastic plates. NO IMPRESSIONS needed with our revolutionary method. We use your own old plates. We remake them completely in only 18 hours. Missing teeth carefully matched and replaced. We GUARANTEE TO SATISFY YOU OR REFUND YOUR MONEY.

SEND NO MONEY—Send us your name today and we'll RUSH COMPLETE DETAILS. Begin to enjoy life right now. Clip this Ad; save it and send for free facts.

CHICAGO DENTAL PLATE LABORATORY • Dept. PS-957

30 N. Dearborn St. • Suite 714 • Chicago 2, Ill.

TRAP DUST AND ODOR* IN YOUR HOME *automatically*



EZ KLEEN AIR FILTERS

ALUMINUM . . . WASHABLE

LOWEST COST AIR FILTER BUY

*AUTOMATIC ODOR REMOVAL with RP SUPER handi-koter

The scientifically compounded adhesive for re-coating EZ Kleens that traps dust, dirt, pollen AND absorbs odors from the air stream circulating through your furnace or air conditioner

RP

FOR FURNACE OR AIR CONDITIONER—Only clean filters efficiently trap more dust and dirt, permit better air circulation, reduce fuel and power costs, increase comfort. With washable EZ Kleens, you can have clean, efficient filters constantly—without frequent shopping. As often as necessary — wash, recoat with adhesive and replace EZ Kleens — they're good as new, last for years. Research Products Corporation, Dept. 230, Madison 10, Wis.

SEE YOUR DEALER OR TELEPHONE DIRECTORY

IN CANADA: HICKS-BAKER LTD., 234 Madison St., Winnipeg; E. G. SPALL & CO., LTD., 601 York Road, Guelph, Ont.

LITTLE-KNOWN BUSINESS

Brings Big MAIL ORDER PROFITS

Albert Duval
Photographer

MEN—WOMEN—OPERATE FROM HOME

Not many people know about this! Real opportunity in uncrowded field, with BIG DEMAND. All portrait photographers must remove blemishes from practically every negative. Much of this interesting work done by men and women **in their own homes**—without big overhead. They get the negatives by mail, return finished product same way. Easy to learn. No previous experience or special skill necessary. Make fine income at home, **anywhere**, spare or full time—big city, small town, or farm. Short instruction course **includes all necessary equipment**—also detailed plans for building a **fine mail order income.** Help fill huge demand by photographers. Rush name & address for complete **FREE** details.

ALBERT DUVAL, Dept. 69, 100 S. Vermont, Los Angeles 4, Calif.

GUNS

AUTHENTIC REPLICAS

Reproduced in Actual Size, Design and Balance. Made of Solid Cast Aluminum. Finished in Gun-metal Black

START COLLECTING NOW!

- ☐ German P-38
- ☐ Colt Cobra .38
- ☐ German Luger
- ☐ German Mauser
- ☐ Spanish Mauser
- ☐ Russian Tokarev
- ☐ Italian Beretta
- ☐ Japanese Nambu
- ☐ Fromm .44 Colt
- ☐ Belgian Automatic
- ☐ Colt .45 Automatic
- ☐ Czechoslovakian Pistol
- ☐ S & W .38 Police Special

Colt Cobra .38

$3.00 EACH POSTPAID

Folder, 10c

No-mess trophies for Den, Rumpus Room, Cabin, Etc. Absolutely safe—Cannot be fired

© 1956
LYTLE NOVELTY CO.
2656-59 Fashion Avenue
Long Beach 10, California

Send Cash, Check or M. O.
No COD'S - No Canada Orders
Add 4% Sales Tax in California

I DARE YOU TO FIND AN EASIER WAY TO MAKE UP TO $1,500.00 IN A MONTH!

Astounding New Improved

MOTOR OVERHAUL

NOW WITH MIRACLE X-303

Hands You Big-Volume REPEAT Business . . . Even Spare Time!

Introduce amazing new 16-oz. MOTOR OVERHAUL to fellow-motorists. Fleet owners . . . make big money fast! Just add to engine oil and get *immediate increases* in compression (up to 58%), gas mileage (up to 54%), oil-saving efficiency (up to 900%) . . . freedom from costly repairs . . . proved by astonishing Independent Laboratory Road Tests. Now contains oil-stabilizer Formula X-303 for instant cold-weather starting, cooler engine in summer. Customers order time and again, hand you a high-profit re-order business you can run in just your spare time! Sells for $2.98 each; you make up to $1.78 profit on every can.

GUARANTEES IMPROVED POWER AND ECONOMY!

Motorists, large-quantity-buying fleet operators order at once on daring, no-risk "You-Be-The-Judge" Unconditional Guarantee, are amazed, delighted when MOTOR OVERHAUL makes good on every promise, re-order time and again!

FREE! Rush coupon with name, address TODAY for big Illustrated Sales Kit, big-profit plans, actual copy of startling Lab Road Test Report, daring "You-Be-The-Judge" Guarantee . . . all FREE, no obligation. If you also want full-size $2.98 MOTOR OVERHAUL to test in your car, enclose only $2.00, and we ship postpaid. Your money back if not amazed, delighted.

POPE CHEMICAL CO., 224 W. Huron, Dept. Y-4, Chicago 10, Ill.

POPE CHEMICAL CO., Dept. Y-4
224 W. Huron St., Chicago 10, Ill.

Rush, Entirely FREE and without obligation, Illustrated MOTOR OVERHAUL Sales Kit, Lab Report, daring Guarantee.

Name.....

Address.....

City..... Zone..... State.....

☐ $2.00 enclosed. Also send full-size $2.98 MOTOR OVERHAUL postpaid. You will refund my $2.00 if I'm not delighted with it.

CUT-TO-FIT HOMES CUT BUILDING COSTS

CHOICE OF 57 DESIGNS

ORDER NOW

SAVE UP TO 1/3

Build your own home and save the builders' profit—plus savings in lumber and labor with Sterling Ready-Cut-Homes. Anyone can assemble with simple, easy to follow plans furnished. Every house complete with all lumber, roofing, nails, glass, hardware, paint, doors and windows marked ready to erect. Freight paid. Complete building plans ready for filing at low cost. Sold separately if desired. Write today!

PRICED FROM $2150 up

Five Easy Payment Plans

Send 25c for NEW COLOR CATALOG

INTERNATIONAL MILL AND TIMBER CO.
DEPT. PS97 BAY CITY, MICHIGAN

SNAPS OPEN WITH STARTLING SPEED

"Faster-than-the-eye-can-see." Will be the center of conversation wherever shown. Extremely dependable and effective as a hunting or fishing companion for urgent situations. Direct import. Heavy steel blade, bone handle. Authentic, unchanged from unique design which has intrigued Sportsmen the world over POSITIVE LOCK, open or closed. SEND check, cash or M.O. Calif. resid. add 4% state tax. Sorry no C.O.D.'s. Satisfaction guaranteed. This offer good only where not prohibited by local laws.

Giant Italian Stilettos

REGULAR (5 9/16" opened) $5.50
GIANT (9" opened) $6.95
COLOSSAL (13¼" opened) $8.95

SEAPORT TRADERS, INC., Dept. 46, 409 E. 12th St., Los Angeles 15, Calif.

GET YOUR

POLIO SHOTS

AND **PLAY SAFE**

THE NATIONAL FOUNDATION FOR INFANTILE PARALYSIS

SAVE 75% ON WORK CLOTHES!

Terrific values you've got to see to believe!

SHIRTS ..... 4 for $2.99 ..... 79c
Tho used, they're sterilized and ready for tough wear. Blue, green or tan. Send neck size.

PANTS to match. Were $3.95, now only . . . 99c
Send waist measure and inside leg length. 4 for $3.75

COVERALLS $2.29 3 for $6.75 **SHOPCOATS $1.79** 3 for $5.00
Wear 'em used, save plenty! Send chest measurement.

MONEY BACK GUARANTEE . . . if not satisfied! Order TODAY! Send $1.00 deposit on C.O.D. orders. Add 25c for postage on prepaid orders.

GALCO SALES CO. Dept. 249
7120 HARVARD AVE. CLEVELAND 5, OHIO

BOAT PLANS-PATTERNS FRAME KITS

A modern up to date series of inboard and outboard designs for the amateur builder. State specific size and type or send 50c for BIG NEW CATALOG.

marine GLEN designs Box 568P Compton, Calif.

WHOOPS!!

Double your friends with howls of laughter . . . The new Party Snapper is like a dash of spice to your party.

Get yours postpaid . . . Order now for only $1.00

POST MART P.O. BOX 593
EL CENTRO, CALIFORNIA

GOVERNMENT OIL LEASES LOW AS $1 PER ACRE.

You do no drilling, pay no taxes, may realize a king-size profit without ever leaving home. Write for free map and literature.

AMERICAN OIL SCOUTS, Dept. PS
7321 Beverly Blvd. Los Angeles 36, Calif.

EARN! New '57-58 Wholesale Catalog SAVE!

- Power Tools
- Appliances
- Jewelry
- Luggage

Over 3,000 Nat'l. Brand Items with wholesale discounts up to 60%. Earn part or full time—sell to friends, relatives. SAVE on own purchases. Send $1.00 for 250-pg. all-color wholesale catalog. FULL REFUND on 1st purchase within one year! Quantity limited.

- Lionel Trains
- Giftware
- Over 3,000 Items!

Get $1.00 Back On Very First Purchase! A. J. STATILE CO. Ridgefield Park, N. J.

$220.00 PROFIT...FAST!

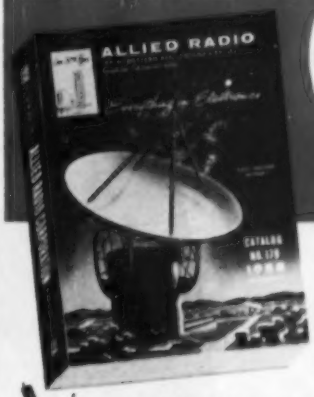
I Sold 44 KANT-SLAM DOOR CHECKS to Just 4 Customers! Says Segrest of Texas

Join Our Exceptional Men Who Make Big Money Every Day

Amazing new invention . . . world's lowest-priced hydraulic door check stops slamming doors, closes heaviest doors gently, smoothly, positively. **Guaranteed 3 years.** Every home, office, factory, building needs 1 to 20 . . . and you make up to $5.00 profit on each one! Repeat orders, too. You can make really big money with KANT-SLAM!

FREE! Send name, address NOW for complete money-making details. No obligation.
KANT-SLAM CO., Dept. M-12, Bloomfield, Ind.

free! ALLIED'S 1958 ELECTRONIC SUPPLY CATALOG



404 value-packed pages

Send for it!

SAVE on everything in electronics

EASY TERMS AVAILABLE

WORLD'S LARGEST STOCKS

Here's everything in Electronics for Experimenters, Builders, Amateurs, Servicemen, Engineers and Hi-Fi Hobbyists:

- Amazing Build-Your-Own KNIGHT-KITS
- Hi-Fi Music Systems & Components
- Recorders & Phono Equipment
- TV Tubes, Antennas, Accessories
- Public Address Systems
- Amateur Station Equipment
- Latest Test Instruments
- Industrial Electronic Supplies
- Parts, Tubes, Transistors, Tools and Books

SAVE on everything in Electronics—get fast, dependable service—send today for your FREE 1958 ALLIED Catalog.

Everything in Electronics From One Reliable Source

our 37th year

Send for FREE Catalog

ALLIED RADIO

ALLIED RADIO CORP., Dept. 7-J7
100 N. Western Ave., Chicago 80, Ill.

☐ Rush FREE 1958 ALLIED 404-Page Catalog

*Name*_____

*Address*_____

*City*_____ *Zone*_____ *State*_____

HELPS YOU BUILD,

Amazing New

Only $3.50

It tunes speaker enclosures just right—by ear

A low-frequency glide band makes it easy to adjust the reflex port, detect faulty construction and smooth out speaker response

It tells how quiet or noisy a turntable is

Silent grooves, cut on the quietest recording lathe known, reveal rumbles in disk-turning mechanisms

It shows up worn stylus or poor tone arm

By sound alone, tone bands tell whether your stylus is defective or tone-arm resonance too high

It tests the setting of equalization controls

One special band helps set equalization or tone controls to match the standard recording curve

It challenges you to name common sound effects

A quiz band of everyday noises makes an amusing party game—and reveals how good a system really is

BUY, CHECK WITHOUT EXPENSIVE DEVICES

Record Reveals Hi-Fi Bugs!

The Electronics Engineers and Editors of Popular Science Monthly have developed this brand new and completely different *33⅓ L.P. test record* as another service to their readers.

12 vital reasons why you need this Hi-Fi engineering tool:

1. Check out your present Hi-Fi rig components and make them better.
2. Learn exactly how to build and tune a bass-reflex speaker enclosure for the smoothest performance.
3. Detect faulty cabinet work that your eyes may have failed to notice.
4. Pin down speaker performance and tell whether it matches up to claims.
5. Put your finger on turntable rumble.
6. Check your stylus and cartridge for wear and misalignment.
7. Spot resonance in your tone arm.
8. Tune musical instruments exactly from the precise 440-cycle musical A tone; you can check turntable r.p.m.'s in the same way.
9. Set tweeter level to match that of mid-range and woofer speakers in three-way systems.
10. The speaker enclosure tuning band, the only one of its kind yet recorded, is a 300-to-20 cycle glide tone repeated over and over, with a cricket-snap sound every 50 cycles. You can hear, feel, and even see bass resonance peaks.
11. Trace the origin of fuzzy sounds with your fingers while playing the glide band at high volume. Then you can remedy them by such simple dodges as adding braces, blocks, or extra wood screws.
12. See whether your friends can recognize an air hammer, circular saw, noisemakers, ice tinkling, bacon frying, alarm clock, Model T Ford, grandfather clock, etc.

Attractive Album and Full Instructions

The record comes to you in a protective dust sleeve and enclosed in an attractive album. Complete instructions for using the record are printed on the back liner of the album.

You may want two!

An extra Hi-Fi Test Record makes an unusually and highly welcome gift for any Hi-Fi fan, or, you may want to keep it, unplayed, as a reference standard to check the one you use regularly.

MAIL **THIS COUPON** TODAY!

MAGAZINE SERVICES, INC., Dept. 957
104 E. 26th Street • New York 10, N. Y.

Please send me, postage free, and *fully guaranteed*, the number of Popular Science Hi-Fi Test Records I have checked below.

☐ $3.50 for one record

☐ $5.00 for two records

(These records are also available at your local record shop. They are distributed by Urania Records, 625 Eighth Ave., N. Y. C. List Price $3.98)

Name_____

Address_____

City, Zone & State_____

My check or money order is enclosed.

To Parents of High School Students in Search of a Career . . .

This may be the most important message of your children's lives

You spend many hours planning your children's future, looking for ways to save them heartaches in the days ahead and give them some good measure of security.

You should know that

> Today there is a rich, new kind of opportunity for young America!

The opportunity lies in engineering and science, where there is a tremendous need for trained young people. It is open to any young man or woman who is willing to work hard and to study high school courses like mathematics and the physical sciences in preparation for college engineering.

Here is what the engineering profession offers your child:

Interesting, useful work. There are hundreds of different engineering positions open, from bridge design to nuclear research, from product planning to salesmanship.

It is rich in opportunity. Today's engineering graduates find starting salaries higher than average. As for opportunity, 50% of the country's industrial leaders started their careers as engineers.

It offers a good measure of security. The need for trained men and women engineers will continue for years to come.

Don't cheat your child of a chance for betterment in the years ahead. Inquire of your high school principal, math or science teacher or any well-known engineer in your community for guidance. To help you—Be sure to read the article entitled "HOW YOUR SON CAN CHOOSE *BOTH* A JOB AND SCHOOL" in this issue. This important message begins on page 114—and is part of a continuing series appearing in every issue of POPULAR SCIENCE MONTHLY.

A PUBLIC SERVICE PROJECT THE ADVERTISING COUNCIL

A marketable ability is the only true security

NEW MODEL 400 SIMPLEX LAWNMOWER SHARPENER

Many Exclusive Features

The NEW SIMPLEX is the fastest, most accurate straight-line lawnmower grinder ever built . . . gives you all these advantages:

- Grinds all mowers—reel type, rotary, hand or power, any size.
- No dis-assembly needed, gas and oil remain in engine, support bar rotates.
- Grinding head feeds both horizontally and vertically, turns 90° for bed knives.
- Fast, positive adjustments, 4-point support on steel base with leveling screws.
- Rugged, long life construction and many other features.

Small investment returns **big profits!**

Get the facts on the new SIMPLEX 400 before you buy any sharpener.

Send for free brochure today

The Fate-Root-Heath Company
Dept. PS-9 • Plymouth, Ohio

The 14' STARFISH . . . Now you can OWN a $1,100 registered Planing Hull Class SAIL BOAT for only $525, complete. Freight prepaid. It's constructed of "Harborite" Plastic covered plywood, with Dacron Sails and stainless steel and chrome hardware throughout. So EASY to assemble . . . 4/5ds of the work is done in our plant. Just put it together and you're ready to SAIL! Owners claim speeds up to 16 knots. It's the ULTIMATE in a family racing sailboat.

• HULL KIT • HARDWARE & RIGGING KIT • SAIL KIT • ONLY $175 each, freight collect. COMPLETE KIT $525. FREIGHT PREPAID.

Assembled at our plant, complete, ready to sail, $1,100 freight prepaid.

PORT MARINE, INC.
P.O. Box 704-a, NEWPORT BEACH, CALIF.

BIG NEW WHOLESALE CATALOG FREE!

WRITE TODAY FOR *FREE CATALOG* SEND POSTCARD

***NOW!* Save Up to 50% on Nationally Advertised Gifts**

Use this big, new FREE CATALOG to buy all kinds of gifts and merchandise for yourself, family, friends, neighbors. Terrific saving on big-name items. Also, make money spare time taking orders from others!

EVERGREEN STUDIOS
Dept. 57, Box 646 Chicago 42, Ill.

JEEP HENRY-J KAISER OWNERS

RE-POWER NOW with a V-8 engine—Use FORD • CHEVROLET • MERCURY

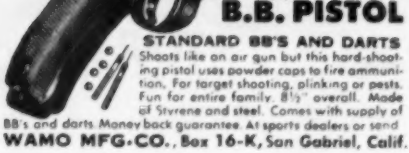
in 2 or 4 Whl-Dr, Jeeps, Jeepsters, Sta-Wgn, Trucks or cars. Conversion Kits $43.25 to $59.85. If you want fast action tell us which engine you wish to use, give us year, Model, (2 or 4 Whl-Dr), of your vehicle. Send Min. $15.00 Dep. and we will ship correct kit. Bal. COD. Send full amt. for Prepaid shipment. Wire, phone or write for free details.

HOOSIER MACHINE PRODUCTS CO.
314 S.E. 6th St. Phone 676 Pendleton, Oregon

ELECTRIFY YOUR SEWING MACHINE! NEW LOW PRICE! $10.95 90 DAY Guarantee

Buy direct and save! Kit comes fully wired, installed in a jiffy. Fits all machines. ALL-NEW PARTS! • AC-DC Motor & bracket • Multi-speed foot control • Cord set & block • 115 v 60 c • Full instructions • Steel pulley & belt BONUS: 10 day free trial. Reg. $2.95 Sewlite given FREE with kit. Reg. $7.95 pinking shears only $1 with order. Send no money. Kit sent C.O.D. Or send money order and we'll pay postage. State whether wheel on your machine turns towards or away from you. Shipping wt. 6 lbs.

SENIOR SEWING MACHINE CO., Box 142, Dept. PS-21, Ithaca 6, N. Y.



Only $2.98

WHAM-O Super Pistol

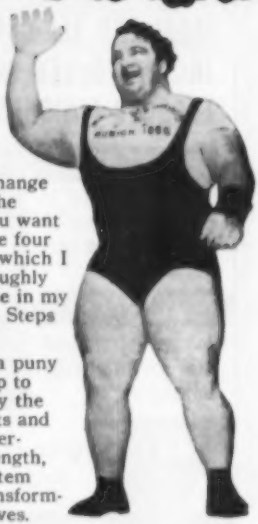
B.B. PISTOL

STANDARD BB'S AND DARTS

Shoots like an air gun but this hard-shooting pistol uses powder caps to fire ammunition. For target shooting, plinking or pests. Fun for entire family. 8½" overall. Made of Styrene and steel. Comes with supply of BB's and darts. Money back guarantee. At sports dealers or send

WAMO MFG. CO., Box 16-K, San Gabriel, Calif.

LET THE WORLD'S STRONGEST MAN Help You Gain a Body to Brag About!



Be the envy of your friends, the admiration of particular girls. Begin AS YOU ARE—skinny, weak, undeveloped, or fat, flabby and short of breath. You can change yourself DAILY into the physical specimen you want to be by means of the four secret fundamentals which I discovered and thoroughly describe and illustrate in my wonder course "Easy Steps to Giant Strength."

I began myself as a puny youth. I was given up to die, but saved by only the prayers of my parents and moved by a deep determination to gain strength, I worked out my system which has meant transforming magic in many lives.

Send TODAY for FREE Book

OLYMPIC CHAMPION *Paul Anderson* WORLD'S STRONGEST MAN

Learn without obligation that there is a sure-fire method for developing the kind of body you would like to have. You can gain weight or lose weight without losing strength. You can build powerful responsive muscles into every inch of your physical frame. You can improve your style and performance in any sport with my tried and proven method. Don't delay—investigate!

YOU TOO CAN WIN MEDALS & TROPHIES

"I have many medals and trophies won in National, Olympic and World competitions in Russia, Germany and Australia. Let me fit you for weight lifting competition greatly growing in favor."

MAIL COUPON

PAUL ANDERSON PS9
Toccoa, Ga.

Send me without obligation your fully illustrated book giving full details of "Easy Steps to Giant Strength." Check marks show the body I want.

☐ Muscular Development ☐ Poise
☐ More Weight ☐ Mental Control
☐ Less Weight ☐ Strength ☐ Health

Name _____ (Please Print)
Address _____
City _____ *Zone* _____ *State* _____

LONGER-LASTING EASIER APPLIED!

IDEAL FOR ALL CAR FINISHES, INCLUDING NEW ACRYLIC LACQUER FINISHES

FAST

45 to 60 minutes to clean, glaze, polish most cars! **One** easy application!

EASY

Rub on, let dry and wipe off! No harsh abrasives!

MAC'S SUPER GLOSS CO., INC.
Los Angeles 42, Calif.
Cincinnati 26, Ohio

DON'T WAX IT—MAC'S IT!

RUPTURED? NEW LASTING RELIEF

ENJOY NEW FREEDOM...

of action, amazing peace of mind and comfort at work or play. New pleasures replace rupture pain. The proven, patented MILLER holds your rupture back Day and Night . . . bringing you new lasting relief as it has thousands of others.

Get FREE facts in plain wrapper. Send Name & Address to-

FRED B. MILLER DEPT. 3-N
Exclusive Manufacturer **HAGERSTOWN, MARYLAND**

NOW NO ONE CAN KEEP A SECRET FROM YOU! 25x-45x-75x **TELESCOPE** only $3.25 postpaid

Amaze your friends... See what they're doing—without being seen!

Money Back guarantee. Send cash, check, or money order today!

Special: Order now, get Free carrying case.

4-range all metal telescope magnifies up to 75 power. Watch ball games, look at the moon, stars, animals, distant buildings...up close. Bright aluminum tube practically unbreakable. Good on hikes, camping trips, can use either 25x, 45x or 75x power instantly. Variable focus eyepiece. No assembling, ready-to-use, no special instructions required!

I. J. STONE, Dept. A-0 • 1815 Oak St. • Santa Monica, Calif.

"CHAMPIONS OF LIBERTY"

An entirely **new** series of U. S. Commemorative stamps. For the **first time** in our history, Statesmen of **other** Nations who have fought for freedom and against oppression will be pictured. **RAMON MAGSAYSAY**, late President of the Philippines is honored with the first stamp in this series just issued at Washington **only** on Aug. 31. Get yourself a **FIRST DAY OF ISSUE** cover of this historical new series for only 35c. Or order 5 **all different** U. S. First Day of Issue covers for only $1. Money back if not thoroughly pleased. But order early. Send for our Free lists.

K. M. WALSH **Box 308** **TUCKAHOE, N. Y.**

FREE LAFAYETTE CATALOG

JUST OFF THE PRESS! NEW 180 PAGE ELECTRONIC CATALOG FEATURING THE BEST BUYS IN THE BUSINESS

Packed with the largest selection of Electronic, Radio and T.V. Parts, and equipment, PA, Hi-Fi systems, tubes, antennas, Transistor Kits, parts and components, Test Equipment, new build your own kits, tools, books, Microscope, drafting equipment, Binoculars, Telescopes, All Radio, TV and Ham supplies—**ALL AT GREAT SAVINGS**—For the economy minded servicemen, dealer, engineer and technician. **CHUCK FULL OF BUYS! SEND FOR YOUR FREE COPY TO-DAY.**

NEW! DELUXE RECORD CARE KIT

A complete set of selected accessories essential to the care and maintenance of records and equipment. Permits examination of stylus and record grooves. Priced right, you save over 25% on this kit.

1- 75 power microscope with needle groove; 1- Clarkstan Pressure Gauge; 1- Anti-static spray and applicator; 1- Polyfoam turntable mat; 1- Level for turntable; 1- Record cloth; 1- Clip-on needle brush; 12- 12" Polyethylene record sleeves; 15- 10" Polyethylene record sleeves; 1- Stroboscope card; 1- Book on the care of records.

PK-138 ..... Net **7.45**

LAFAYETTE HI-FI LP TEST RECORD

Ideal for audiophile who is building a bass reflex speaker enclosure, or wants to check the components already in use. Two-side, 12" LP record covers cartridge and stylus test, turntable rumble test, average and minimum recording levels, stylus and tone arm resonance check, equalization checks, sound effects, tuning bass reflex enclosures, and a group of delightful music box selections. Specially recorded with painstaking care at 33⅓ RPM, and master cut on a mechanism that produces the quietest grooves in the industry. Complete with instructions for use and colorful protective envelope. Shpg. wt., 1 lb.

PR-10. Hi-Fi Test Record ..... Net **2.25**

Lafayette Radio **165-08 Liberty Ave. JAMAICA 33, N. Y.**

DEPT L.J.

"HAVE FUN"

Surprise your sweetheart or anyone else by writing them a letter, addressed and stamped with air mail or 3¢ stamp. Address another envelope to us, put your letter and 35¢ in the envelope addressed to us, and we will remail your letter so it will have Houston, Texas post mark. The one who receives it will think you are in Houston . . . a big surprise for them.

HOUSTON REMAILING SERVICE
6344 Brompton **Dept. C** **Houston 5, Texas**

Saving for Security Is Easy

It's actually easy to save money—when you buy United States Series E Savings Bonds through the automatic Payroll Savings Plan where you work!

TREMENDOUS Profits with Hagen's Exclusive TEAR GAS PENCIL!

This Tear-Gas Pencil discharges smothering clouds of tear gas to instantly stop, stun and incapacitate the most vicious man or beast, an effective substitute for dangerous firearms; leaves no permanent injury. No selling experience needed. Handle as a profitable sideline . . . . soon you'll sell it full time. Start now! Send $5.95 for complete demonstrating kit of Automatic Tear Gas Pencil. 10 demonstrators & 3 Powerful Tear Gas Cartridges. Not sold to minors.

SELLS EASY TO SERVICE STATIONS SMALL STORES LOAN OFFICES BANKS, HOMES

HAGEN SUPPLY CORP., Dept. P-97, St. Paul 4, Minn.

View of one of the lawns surrounding the lovely $200,000 home of Spurgeon Pickering, owner of Mondo Grass Company, on the beautiful beach of the Gulf of Mexico; the entire 7 lawns, sidewalk shoulders and neutral grounds are planted solidly in Mondo "Grass," truly one of the most attractive show places of the South.

NOW IS GOOD TIME TO PLANT OR

CAN BE PLANTED SPRING-SUMMER-FALL-WINTER

(If ground is not frozen)

BLUE-GREEN

MONDO "GRASS"

Trade Mark Registration applied for U. S. Patent Office

REQUIRES NO MOWING —GREATLY BEAUTIFIES LAWN

Our Blue-Green Mondo "Grass" is described by the U. S. Department of Agriculture as "Ophiopogon Japonicus, technically called ground cover (formerly called Mondo Japonicus), is native to Northern China and should withstand severe degree of freezing; drought tolerant, evergreen, commonly called Mondo Grass."

It is a "grass" relative to the lily with paper thin blades 1/16" wide. This sod-forming EVERGREEN, low-growing oriental genus is currently used by many owners of distinctive homes in America for lawn grass. Now we can offer this exclusive Blue-Green Mondo "Grass" at popular prices.

SO HARDY IT CAN BE PLANTED ANYTIME, it is recommended for enhancement of lawns where mowing is not desired. Blue-Green Mondo "Grass" retains its color the year-'round; might brown off in the extreme northern U.S.; thrives in shade or sun; extremely hardy, rarely requires watering; fantastically beautiful, drooping low to the ground in weeping style year after year. REQUIRES NO MOWING.

Ideal for heavy shaded areas or sun, dry or wet. FREE folder of testimonials and many photos of Mondo lawns sent on request.

Mondo is resistant to diseases; insects and animals will not feed on it. Stops erosion; grows compactly, crowding out other grass and weeds; multiplies rapidly, approximately 100 times (10,000%) first year if properly handled. Enhances property value. So sensational we expect to revolutionize lawn-making. For good coverage first year plant 2" to 6" apart. Numerous rooted blades to sprig.

Planting and culture instructions with each order. Remittance with order. Shipped prepaid. MONEY-BACK GUARANTEE; if not completely delighted you may return at once for refund. Open accounts to A-1 rated firms buying 1,000 sprigs or more, FOB. Biloxi.

ORDER TODAY . . . YOU CAN'T LOSE!

Sprigs packed in damp moss. Guaranteed to grow or we will replace.

25 Sprigs	$ 2.98
50 Sprigs	5.00
100 Sprigs	9.00
500 Sprigs	40.00
1,000 Sprigs	79.00
5,000 Sprigs or more per 1,000	50.00

MONDO GRASS CO., Dept. PS-9, Biloxi, Miss.

I enclose $..... for Prepaid Shipment ..... Sprigs Mondo "Grass."

Ship (check one): Now.....

At Proper Planting Time..... Or When?.....

Name.....

Address.....

City..... State.....

World Famous ROCKWELL

Carbide Tipped Circular Saw Blades

At Fantastic Reductions!

There's no finer name in saw blades than Rockwell! Now, you can buy these blades, in original factory packages, at amazingly low price. Will fit most radial and portable saws. Carbide tip and perfect balance is your assurance of perfect cutting through all varieties of wood and wood laminates plus aluminum, magnesium, formica, fiesboard, plastics, gypsum board, teak, plywoods, rubber, floorboard, lucite, bakelite, tileboard, masonite and similar materials.

6" blade with 10 teeth	$7.98
7" blade with 8 teeth	7.98
7" blade with 14 teeth	9.98
8" blade with 8 teeth	7.98
8" blade with 16 teeth	12.98
10" blade with 18 teeth	14.98

All prices plus 50c for pp. & hdlg.

In ½" and ⅝" round and ½" and 13/16" square bores to fit Skil, Thor, Mall and Cummins saws. Please specify when ordering.

OUR BEST VALUE OF THE YEAR!

2½ AMP. HEAVY DUTY ¾" THOR Speedrill

with Geared Chuck AC-DC 2400 RPM

BRAND NEW! $14.95 plus 50c pp. & hdlg.

If your work calls for a "rugged" drill with POWER to SPARE, insist on a 2½ Amp. job ..... and make sure it's THOR! No finer drill made! Solid steel, heat-treated helical gears; thrust taken on hardened steel ball and plate; gears permanently packed and sealed in LIFETIME grease! Switch, trigger and lock assembly simplifies locking and releasing trigger. You'll be wise to buy 2 at this price. Supplies limited!

PRECISION

DRAFTING SET

11-Pc. - $3.98 ppd.

High lustre chrome plated instruments of outstanding quality and accuracy. Set includes Plain and Ring-head Bow dividers, Compasses for use with ink or pencil, Ruling Pens and all necessary parts. Packed in a velvet-lined, snap button closure, simulated leather case.

AUTOMATIC

SIPHON PUMP

sensational low price $1.98 ppd.

Now — siphon any liquid automatically, safely, WITHOUT putting tube to mouth! Squeeze bulb, liquid starts to flow immediately! Transparent sections let you see liquid flowing! Siphons cognac, gasoline, water, any liquid. Even acids, corrosives! For cars, boats, power mowers, canners, plumbers, doctors, chemists, factories! Acid resistant. Over 7 ft. long!

Send Check or M.O. If C.O.D., fees extra. Money Back Guarantee

SCOTT-MITCHELL HOUSE, INC., Dept. M-435, 611 Broadway New York 12, N. Y.

UNIMAT

MINIATURE MACHINE SHOP

"No bigger than a typewriter, outperforms machines many times its size." That's what Mechanix Illustrated says about UNIMAT in a 3 page feature story. UNIMAT is the precision tool that craftsmen, inventors and hobbyists dream about. You just can't beat it for machining small parts from steel, brass, aluminum, wood and plastic. You'll want a free reprint of this story plus complete information about this amazing 10 in 1 workshop. Write today to:

AMERICAN EDELSTAAL, INC. • UNIMAT DIVISION
Dept. 197 • 350 Broadway • New York 13, N. Y.

MIDGET RACERS' 1st CHOICE

...Continental Air-Cooled POWER

AU Series
2 to 4 hp.

Finest power for racers, scooters, lawnmowers, garden tractors—any job within their capacity—is one of today's Red Seal heavy-duty air-cooled models. They're built to get up and go, and backed by engine experience dating from 1902. Greater piston displacement gives power in excess of rating, plus low-speed lugging ability that eliminates stalls. Exclusive Contex ignition system speeds and simplifies adjustment, doubles life of points and plug. Optional low oil level ignition cutoff ends hazards of running dry. NOW AVAILABLE with built-in flywheel generator for charging batteries or lighting lights. For name of Red Seal dealer nearest you, write TODAY.

CONTINENTAL MOTORS — Bow Tie — as the Nation — AMERICA'S STANDARD

Continental Motors Corporation
INDUSTRIAL AIR-COOLED ENGINE DIVISION
12800 KERCHEVAL AVE., DETROIT 15, MICH.

TELEPHONES

and ALL SUPPLIES

Room to room, house to garage, private telephone service.

HANDSET CRADLE TELEPHONES (2). Complete outfit with 100' wire, 2 dry cells, instructions, $14.95

WORM HARVESTER—Dan Mac Magneto — gathers fish-worms by electricity. Complete with instructions, **$6.50**

Illustrated booklet "AA-27" 10c

TELEPHONE REPAIR & SUPPLY CO. Dept. AA-27
1700 Lunt Ave., Chicago 26, Ill.

Train at Home or in the Big Allied Shops

AIR CONDITIONING HEATING & REFRIGERATION

Get into this high paying field. Learn easily and quickly in your spare time AT HOME or in 100 HOURS OF SUPERVISED SERVICING IN OUR CHICAGO SCHOOL. Tools and equipment supplied. Mail coupon today for free book and sample lesson—no obligation.

ALLIED SCHOOL OF MECHANICAL TRADES
ALLIED INSTITUTE OF TECHNOLOGY
1338-42 So. Michigan Ave., Dept. P5-9A, Chicago 5, Ill.
Gentlemen:
Mail me FREE BOOKS explaining ALLIED'S training program in AIR CONDITIONING, HEATING and REFRIGERATION.
☐ I am interested in resident training ☐ Home study

Name _____ Age _____
Address _____
City _____ County _____ State _____

GIANT 6 FOOTERS 59c

Wow! Genuine Neoprene government surplus (never used) . . . giant 6 ft. across, 21 ft. around . . . at a fraction of original cost. Durable. Can paint on advertising message, inflate and fly. Visible for miles. Great for attracting crowds to fairs, openings, school proms, gas stations. Fun for young and old in backyards or picnics, at the beach, etc. use as water markers & buoys. Order today—only 59c each.

Special: 2 for **$1.00**; 5 for **$2.00**; 13 for **$5.00**. No C.O.D.

P.O. Box S-27104, Hollywood 27, Calif.

GOVERNMENT 40 ACRE

OIL LEASE $100

Act of Congress gives citizens equal rights with Oil Co's. to obtain Govt. leases. You do no drilling, yet may share in fortunes made from oil on public lands. (Payments if desired) Licensed & Bonded Oil Brokers. Free Information & Maps of booming areas. Write:

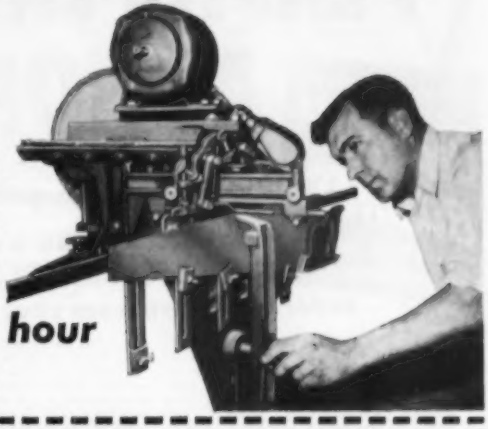
NORTH AMERICAN OIL SURVEYS
8272-AN Sunset Blvd., Los Angeles 46, Calif.

This man is looking into your future

How does it look? Rosy? Free of cancer? You hope! But hoping isn't enough. Of every 6 Americans who get cancer this year, 3 will die because science still has no cure for them. It will take research . . . *lots* of research . . . to find that cure. And research, let's face it, takes money. Pitch in and help. Send a generous check . . . right now . . . to "Cancer" in care of your local Post Office.

American Cancer Society

"WE PAID FOR OUR HOME with a Foley Saw Filer"



Here is the true story of Leslie Patrick—as told by his wife, who wrote us about their success in a town of 12,000.

"I can truthfully say that when Mr. Patrick got his Foley, he made a good and wonderful investment. When we moved here in March, 1946, we had only a Model A Pickup and all our belongings were in it. Since then, my husband has done so well with his Foley Saw Filing Machine and repair shop that we bought a house and paid for it and have two nice boys; bought a new car and built an addition to our house; and he has got a lot of new machines in the shop that a person needs in business. Nicest of all, it is all paid for."

Make up to $3 or $5 an hour

With the Foley Automatic Saw Filer you can sharpen hand, band, and circular saws just like new. Start in spare time, in your garage or basement. No experience needed. Build up a steady, repeat CASH business which will buy YOU a home or new car. Send coupon for FREE BOOK—"Money Making Facts". No salesman will call.

FOLEY MFG. CO., 919-7 Foley Bldg., Minneapolis 18, Minn.

Send Free Book "Money Making Facts".

Name_____

Address_____

NEW DO-IT-YOURSELF SHOE

Style No. 206 *combines:* sporty, *light* weight styling in soft boot leather . . . with the sturdy support of a work shoe!

also Style 205 oil-treated burgundy upper, neo-crepe sole

Work in Comfort while you "do-it-yourself"

Suburbanite styling plus sturdy construction. A shoe specially made to meet the needs of the weekend handyman and backyard farmer. Glove-soft tan upper leather, Quilton treated for water resistance. 7-inch height gives protection in brush, provides support without "high" boot weight. Comfortable, non-slip corduroy crepe sole . . . storm welted all around.

STAR BRAND
work and sport shoes

"Star Brand Shoes are Better!"

For nearest dealer, write . . .
ROBERTS, JOHNSON & RAND, Division of International Shoe Co., St. Louis, Mo.

Superior's New Model 70 UTILITY TESTER ®

FOR REPAIRING ALL ELECTRICAL APPLIANCES MOTORS • AUTOMOBILES • TV TUBES

As an electrical trouble shooter the Model 70:

- *Measures A.C. and D.C. Voltages, A.C. and D.C. Current, Resistances, Leakage, etc.*
- *Will measure current consumption while the appliance under test is in operation.*
- *Incorporates a sensitive direct-reading resistance range which will measure all resistances commonly used in electrical appliances, motors, etc.*
- *Leakage detecting circuit will indicate continuity from zero ohms to 5 megohms (5,000,000 ohms).*
- *Will test toasters, irons, broilers, Heating Pads, Clocks, Fans, Vacuum Cleaners, Refrigerators, Lamps, Fluorescents, Fans, Switches, Thermostats, etc.*
- *Will test all TV tubes for open filaments, inter-element shorts, burned out tubes, etc.*

As an Automotive Tester the Model 70 will test:

• Both 6 Volt and 12 Volt Storage Batteries • Generators • Starters • Distributors • Ignition Coils • Regulators • Relays • Circuit Breakers • Cigarette Lighters • Stop Lights • Condensers • Directional Signal Systems • All Lamps and Bulbs • Fuses • Heating Systems • Horns • Also will locate poor grounds, breaks in wiring, poor connections, etc.

Model 70 comes complete with 64 page book written in plain easy-to-understand language. Explains laws of electricity, how to proceed with repairs of appliances and automobile circuits, how to test TV tubes, etc. Only **15.95**

SHIPPED ON APPROVAL

NO MONEY WITH ORDER—NO C.O.D.

Try it for 10 days before you buy. If completely satisfied then send $9.85 and pay balance at rate of $4.00 per month for 3 months — No Interest or Finance charges Added! If not completely satisfied, return to us, no explanation necessary.

MOSS ELECTRONIC DIST. CO., INC.
Dept. D-385, 3849 Tenth Ave., New York 34, N.Y.

Please rush me your Model 70. If satisfactory I agree to pay $3.85 within 10 days and balance at rate of $4 per month until total price of $15.85 plus postage is paid. If not satisfactory, I may return for cancellation if desired.

Name_____

Address_____

City_____ Zone____ State____

Get into...

PLASTIC LAMINATING AT HOME!

Sensational New "ONE MAN BUSINESS" ...pays $10 to $20 profit for each dollar of cost.

Make $20 to $30 a day by our MAGIC MAIL PLAN... get orders and cash from your mailman!

Here's the newest and most fascinating of all home-operated businesses. For the first time, a simplified machine brings the fabulous profits of Plastic Sealing and Plastic Laminating within the reach of the small operator. Can be operated in a corner of the kitchen, basement, or garage. And any man or woman, regardless of age, education, or experience—can learn this interesting work *in a few minutes of reading*—can turn out professional jobs *after one hour's practice.*

TWO EXCITING FIELDS FOR BIG PROFITS!

No house-to-house canvassing. No face-to-face selling. We not only supply the equipment you need for the work, but also show you exactly how to cash in big daily profits from two big demand fields.

A FORTUNE IN PLASTIC SEALING

Millions of people want to protect valuable cards, photographs, documents and papers against wear, soil, and damage. By our MAGIC MAIL Plan you get this business through the mails. Open envelopes and take out money and orders. Details of this plan will amaze you. It will be sent free. Just mail coupon.

ENORMOUS PROFITS IN LAMINATING

A creative, artistic business. Gift shops sell your entire output. Just a few of thousands of giftwares illustrated on this page. Beautiful colors. Endless designs. Exclusive "one of a kind" appeal brings sales at ten to twenty times the cost of materials. Beautiful illustrations and instructions for making these artistic novelties sent free.

The opportunities in Plastic Laminating are so big that space here does not permit even skimming the surface. To get any idea at all of the size of these markets and your place in this sensational business you must read the details. See for yourself how easy it is to do the work—how you can put plastic sheets into your machine and take out a fortune—how money and orders come to you in the mail—how gift shops clamor to get more and more of your creations—how you can start with one machine and build up a big production plant with others doing the work—how you can get money and business from every State in the Union—how you can achieve independence without study or experience.

FREE

RUSH COUPON

Never before has such an opportunity been offered the small, home-operator—an opportunity to gain complete personal independence in a big money business of your own. Don't lose a minute. Get the facts at once. All information, fully illustrated with pictures, is free. Send the coupon—or send your name and address on a postcard. There is no charge now, or at any other time. Send for the information on this exciting opportunity today.

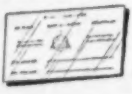
NO MONEY—Just Send Name!

WARNER ELECTRIC CO.
1512 Jarvis, Dept. L-3-K, Chicago 26, Illinois

$5-$10-and $20 BILLS COME TO YOU IN THE MAIL

By our MAGIC MAIL Plan you sit at home, send out mail, and get back money and orders. Additional profits in supplying lifetime protection for SNAPSHOTS—IDENTIFICATION CARDS—DISCHARGE PAPERS—DRIVERS' LICENSES—SOCIAL SECURITY CARDS—VOTERS REG. CARDS—MENUS—BIRTH CERTIFICATES—CREDIT CARDS—BIRTH AND WEDDING ANNOUNCEMENTS—PASSES—DOCUMENTS.

Lifetime protection. See how laminating prevents soiling, wear, and moisture damage with flexible, plastic covers.



Thousands of Beautiful ART CREATIONS

Made by Laminating as explained in our Free information. Send coupon for list and pictures of COSTUME JEWELRY—JEWELS—CIGARETTE BOXES—CUFF LINKS—NOVELTY BUTTONS—TRAYS—CANDLESTICKS—COASTERS—CLOCK CASES—LAMP BASES—PICTURE FRAMES—BOOK ENDS—CHARMS—ADVERTISING SIGNS—NAME PLATES—BELT BUCKLES—CHECKERS—PAPER KNIVES—CHESSMEN—BOOKMARKS—TIE RACKS—KEEPSAKES OF ALL KINDS.

WARNER ELECTRIC CO., Dept. L-3-K
1512 Jarvis Avenue, Chicago 26, Illinois

Please mail, postage prepaid, complete information with illustrations showing the things I can make and the money possibilities in Plastic Laminating. All this is free. No Salesman is to call. Also, tell me how I get orders and money from my Postman by the MAGIC MAIL Plan.

NAME _____

ADDRESS _____

CITY _____ ZONE _____ STATE _____

WORLD'S GREATEST

CLASSIFIED

OPPORTUNITIES

Here are hundreds of opportunities offered especially to the readers of Popular Science Monthly. Read them. Answer them! You can make and save money.

POPULAR SCIENCE MONTHLY — 353 FOURTH AVE. — NEW YORK CITY 10

Classified Ads only $1.00 per word insertion, payable in advance. Minimum ad 10 words. To be included in November issue, copy should be in our office by September 24. No cancellations accepted after September 15. Address orders to O. K. Kelly, Classified Adv. Mgr.

1 AUTOMOBILES & MIDGET CARS

OLD copies of Popular Science wanted—any issue from period 1890 to 1915. Condition not too important provided books are complete with no pages removed. Write to Box No. 308, Tuckahoe, New York.

STOP Cooling System Rust, improve efficiency, save repair costs—easy way. Write Laircraft, Box H-5008, Detroit 35, Michigan.

PONTIAC Hardtops Brand New 1957 Models Only $2495.00 Delivered At The Factory. Franklin-Weber Pontiac, 6101 N. Clark St., Chicago, Illinois.

HUNDREDS of automobile catalogs—old, new and foreign; dealer books, glossy photographs, shop manuals; free motor magazines listed by non-profit club. Write to get on free mailing list. Auto Maniacs, Inc., Stockbridge, Michigan.

BOYS' Power-Driven Auto. Build Your Own. Plans 25c. B.M. Sypher Company, Sta. F, Toledo, Ohio.

BUILD The Best Midget Roadster. Easy To Follow Plans, Parts List And Assembly Instructions Only $1. Plans, 4020 Linden, White Bear Lake 10, Minnesota.

IF you have a product or service that can be operated on a mail order basis, write me today. I will send you a Free Kit on "How To Make Money Out Of Classified Advertising". Next issue will be November. Closing date September 24th. Hurry—Do it Today! O. K. Kelly, Classified Adv., Mgr., Dept. 97, 353 Fourth Avenue, New York 10, N. Y.

2 AUTO SUPPLIES & EQUIPMENT

SAVE money on Jeep and army truck parts. Large inventory. Catalogs for Jeep and G.M.C. owners American Auto Parts Co., 1830 Locust, Kansas City, Missouri.

AUTO Accessory and Parts Catalog, 1957 edition—all new! 228 pages. Save up to 50%—75,000 items, including Hollywood accessories, hi-speed equipment, rebuilt engines, all parts and accessories for all cars and trucks! Hard-to-get parts! Send 25c (refundable). J. C. Whitney, 1919 PS Archer, Chicago 16, Illinois.

GOVERNMENT Surplus safety belts $2.00 each, jeep tops $7.50, curtains $2.00 each. F.O.B. Jacksonville, Texas. Surplus Sales.

CARRY overloads in trunk of car safely with Ajustable Trunk-lid Lash. Ideal for emergency loads, etc. Fits any car. Guaranteed. $1.95 postpaid. G G Sales, 5058 W. Wolfram Street, Chicago 41, Illinois.

MONOFLEX Auxiliary Suspension handles overloads and torque. Improves ride. Easily installed. Monoflex Springs, Reading, Pennsylvania.

BATTERY Vitalizer. Doubles new battery life. Rejuvenates old batteries. Increases power for starter, radio, lights. Guaranteed. $1.00 postpaid. Modern Chemicals, 1050 Lake Str., San Francisco 18, California.

USE THIS HANDY INDEX TO FIND WHAT YOU WANT

Advertising, Agencies for Advertisers ... 53
Agents Wanted ... 43
Air Conditioning ... 7A
Antiques, Relics & Indian Goods ... 29
Artists Supplies ... 76
Authors Service ... 52
Auto Supplies & Equipment ... 2
Auto Trailers ... 3
Automobiles & Midget Cars ... 1
Aviation ... 5
Batteries, Generators, Etc. ... 6
Boats, Outboard Motors ... 11
Body-Building Courses, Jiu Jitsu, Etc. ... 12
Books & Magazines ... 23
Build It Yourself ... 66
Business Opportunities ... 37
Business Service, Information, Name Lists ... 50
Buy It Wholesale ... 38A
Cameras, Photo Supplies ... 34
Camping Equipment & Tents ... 16
Cartooning, Sign Painting, Chalk Talks ... 54
Chemistry & Physics ... 41
Coins & Currency ... 26
Color Photo Finishing ... 32A
Contests ... 46
Detectives ... 47
Dogs, Birds, Hamsters & Pets ... 17
Earthworms ... 18
Educational & Instruction ... 45
Electrical Supplies & Equipment ... 7
Enamels, Paints & Varnishes ... 64A
Engines, Motors, Etc. ... 10
Farms, Other Real Estate ... 19
Field Glasses, Telescopes ... 14
For Inventors ... 60
For Sale Miscellaneous ... 71
For the Home ... 69
Formulas, Plans, Etc. ... 39
Games & Entertainment ... 24A
Geiger Counters, Treasure Finders ... 77
Help Wanted ... 42
High-grade Salesmen ... 44
Hobbies, Collections ... 31
Home Craftsman ... 65
Hypnotism ... 24
Inventions Wanted ... 61
Language Outfits ... 48
Machinery, Tool Supplies, Etc. ... 9
Magic Tricks, Puzzles, Etc. ... 25
Manufacturing ... 63
Minerals & Precious Stones ... 30
Miscellaneous ... 79
Models, Model Supplies ... 68
Moneymaking Opportunities ... 38
Motion Pictures, Slides, Sound Equip. ... 33
Motorcycles, Bicycles & Supplies ... 4
Music, Song Writer & Record ... 35
Of Interest To Women ... 70
Old Gold, Jewelry, Watches ... 67
Old Stamps Wanted ... 27
Patent Attorney ... 59
Patents For Sale ... 62
Personal ... 80
Photo Finishing, Photocopies, Etc. ... 32
Plastics ... 40
Plays, Stories, Etc. ... 49
Poultry & Supplies ... 21
Printing, Mimeographing, Etc. ... 57
Printing Outfits, Supplies ... 58
Profitable Occupations ... 22
Radio, TV, Supplies & Equipment ... 36
Razor Blades, Shavers ... 74
Rubber Stamps & Office Supplies ... 56
Special Services ... 51
Sporting Goods, Guns, Fishing Tackle, Etc. ... 15
Stamp Collecting ... 28
Tattooing Supplies ... 75
Tobacco & Pipes ... 68
Trees, Shrubs, Roots & Herbs ... 20
Typewriters & Office Machines ... 55
Wanted to Buy ... 72
Watch Repairing ... 76
Wearing Apparel ... 73
Welding, Soldering ... 8

ADD More Life To Your Motor! Save oil—get better compression! Guaranteed with new, quick, easy, inexpensive method! Free details! Bauer Specialties, Box 855-X, San Francisco 1, California.

FREE motor overhaul. Improve engine while driving. Information 10c. Pineo, Fremont, New Hampshire.

CUSTOMIZE, repair dents, paint your car. Free information. Bodymechanics, Box 460, Bluefield, West Virginia.

MOTOR Overhaul Stop Oil Pumping. Send name. Details. Taylor, 4832 Lincoln, Chicago 25, Illinois.

EARN up to $150 with five magic words. Beach, 16220 Benwick, LaPuente, California.

RING—Valve Job while you drive, $6.00. Safe! Proven! Guaranteed! Free details. Motaloy, Grantham 27, Pennsylvania.

DRIVE over alignment gauge. Smaller, faster, outperforms. Free data, free trial. $27.48. Align-A-Matic, 62H Gaston Street, W. Orange, New Jersey.

"OFFICIAL Press" car emblem. Looks authentic! Adds prestige! Mail one dollar to Official Press Signs, 131-35 Francis Lewis B'lvd., Laurelton 13, New York.

3 AUTO TRAILERS

BUILD Expanding eight foot trailer. Accommodates five. Literature 10c. Framar Company, Wilmington, Massachusetts.

4 MOTORCYCLES, BICYCLES AND SUPPLIES

RECONDITIONED Motorcycles and motors. Chromium accessories. Complete stock Indian parts. Expert rebuilding. Fast service. Indian Motorcycle Sales, Kansas City 27, Missouri.

DOODLEBUG motorscooter $12.50, Midget Car $25, less engines. Harley engine $5, Whizzer $5, Indian motor and propeller $6, Maytag $4. (mailorder only). Send 25c (35c for First Class Mailing) for 32 page Directory-Catalogue Number 79 listing these and hundreds of other bargains in motorscooters, midget cars, homebuilders parts, plans, etc. Midget Motors Directory, Athens, Ohio.

WHIZZER $7.50; 1955 Motorscooter $7.80; Indian Motorcycles $30.00; Midget car reasonable. Send 25c (35c first class mail) for catalog #31 jammed with sensational bargains in motors, motorscooters, midget cars, motorbikes, construction plans. Gail, 1313 Jefferson, Toledo, Ohio.

5 AVIATION

AVIATION Surplus Bargain Catalog. One Dime. Box 22PS9, Thomasville, Penn.

PROPELLERS, plans, supplies for airboats and snowplanes. Latest designs, prompt delivery. Catalog 25c. Banks-Maxwell, Box 3301G, Ft. Worth 5, Texas.

POPULAR SCIENCE OPPORTUNITIES

HOMEBUILT Helicopter Handbook. $1.00 Urshan, Box 4332 N.P. Station, San Diego 4, California.

7 ELECTRICAL SUPPLIES & EQUIPMENT

DC Power Supplies, Laboratory, Test Units DC Motor Controls. Complete line selenium rectifiers, meters, transformers and other replacement parts. Ramyr, Dept. D-2, 1624 East First Street, Los Angeles 33, California.

200 STUNTS, 110 volts $1.00. Cutting, 26278 Arastradero, Los Altos, Calif.

MAGNETIZE One To Million Screwdrivers $2.00. Kubiak, Huntingdon Valley, Pennsylvania.

LAMP parts Wholesale Thousands of items for repairing, converting Catalog 25c. Brown Lamp, Box 305D, Clayton 5, Missouri.

ELECTRIC Pencil: Engraves all Metals. $2.00. Beyer Mfg., 10511-C Springfield, Chicago 43.

FLUORESCENT Fixture Kits, Fixtures. From $1.95. Catalog 15¢. Shoplite, 6508 Franklin Avenue, Nutley 10, New Jersey.

8 WELDING, SOLDERING

NEW, Timesaving oxy-acetylene outfit welds, cuts, heats, brazes. Just change tips. Light, compact, portable. Thrifty to operate, ruggedly built. Complete outfit and instructions, only $84.50. Special economy plan for supplying gas cylinders. Write for free literature: Dept. S, Linde Company, 30 East 42nd Street, New York 17, New York.

BUILD-Your-Own welder or welder and power combination. Low cost unit connected to used engine lets you weld anywhere. Free booklet tells how. Get into profitable welding business. Write Hobartweld, Box P-972, Troy, Ohio.

WELDERS, 110/220. Welds ⅛". $39.50. Morris, 1070 Inner Drive, Schenectady, New York.

ACETYLENE Welding Outfits new $54.50; used $34.50; Arcwelders $56.50. Eagle Welding, Dept. 42, 5085 Broadway, Chicago 40, Illinois.

A. C. Welders, four sizes, lowest prices. Free Literature. Holgerson Co., Canton, Kansas.

9 MACHINERY, TOOL SUPPLIES, ETC.

POWER Tools, not toys. Discounts. Factory catalogs. World Tool Supply, Box 4404, Joyfield Station, Detroit 28, Michigan.

OIL Drum Cement Mixer Assembly Kit. Circular. Nu-Way-Do Co., Newaygo, Michigan.

GAGES—Scribers—Model Builders' safety knives. Campbell Tools Co., 1424 Barclay Road, Springfield, Ohio.

10 ENGINES, MOTORS, ETC.

GAS Engines: Foreclosure Sale: 1½ to 7 H.P. Brand New, Factory Fresh, Latest Models: Briggs Stratton, Clinton, Lauson. Positively Below wholesale prices or Your Money Back. $29.95 & up (Freight Paid): Details Free: Northern, 172-S Merrimac Street, Boston 14, Massachusetts.

REWIND Motors yourself. Complete instructions $1.00. Lewis Mfg., Howell 11, Michigan.

ELECTRIC Repair. Men send for catalog of Ohmmeters, Winding and testing equipment. Motor Industries, Quincy, Illinois.

11 BOATS, OUTBOARD MOTORS

NEW, used, rebuilt marine motors. Marine conversions, fittings. Free Catalog. Stokes Marine Supply, Dept. 23, Coldwater, Mich

FREE big catalog; Boat Kits save ½ to 2/3 "factory built" prices. 8' through 18' outboards designed for amateur assembly. Trailers, Fiberglas, Hardware, Accessories. Luger, Dept. K9, 3404 Lyndale South, Minneapolis 8, Minnesota.

BOAT Plans—Full Size Patterns—Frame Kits. Modern Inboards and Outboards for amateur builders. Complete New Catalog 50c or specify requirements. Glen Marine, Box 568, Compton, Calif.

FIBERGLASS Boat Coverings, wholesale prices. Free literature, samples. Seifert's, Box 31X, DePere, Wisc.

WOOD or Molded Fiberglass Boats or Kits, Plans, Patterns. Marinecraft, Box 161-P, Brighton, Massachusetts.

MARINE conversions for Ford and Jeep engines. Catalog 25c. Lehman Manufacturing Co., 972A Broad St., Newark 2, N.J.

OUTBOARDS; guns at discount! Free list. Wholesale catalog, many items, 50c. George Denton, California, Maryland.

12 BODY-BUILDING COURSES, JIU JITSU & ATHLETIC EQUIPMENT

BE Taller! Be taller; Be taller! Coach's genuine "Inch-At-A-Time" height-increase System—new edition—$1 complete. Beware imitators. Satisfaction guaranteed. Marty Snyder, Box 195-PH, Union City, New Jersey.

BUILD powerful arms, chest, shoulders! 22 exercises, $1. Fonsad, Box 601-C, 1100 Market, Wilmington 99, Delaware.

WEAK Back—Strengthen Lower Back Muscles—No Equipment—Free Literature —"Lucky" Stein, 311 Delsea Drive, Woodbury, New Jersey.

OUTSTANDING Physical Development! Any Age. New Guaranteed Discovery Uses Only A Rope! Strength, Health, Muscles, Gain-Reduce. Free Booklet. Ropercise, 4834-B Art, San Diego 15, California.

FREE details—Gaining or reducing. Dr. Fred Stahl, Box 356, Stanhope, New Jersey.

WANT to learn "Jiu Jitsu"? Clearly illustrated book shows latest methods! Only $1.00. "Scientific Boxing" sent Free with each order! Southland Products, Box 41, Lincolnton, North Carolina.

BARBELLS, Dumbbells, Exercise equipment Courses. Free booklet. Good Barbell Co., Reading, Penna.

PUSHED around? Don't take nonsense from bullies. Give them the shock of their lives. Easy when you know Police Jiu Jitsu. Complete fully illustrated course in one volume as taught police and armed forces. Send $1 now. Money back guarantee. Books Publishing Co., Amityville 39, N. Y.

BE Taller! ABC Method $1.00. Guaranteed! ABC, Box 849, San Francisco 1-J, California.

EMERGENCY Ju-Jitsu course, $1.00. The most effective techniques known. North Jersey Ju-Jitsu Clubs, Mountain View 2, New Jersey.

BARBELLS, Body Building equipment, Courses, Free Catalog. Reading Barbell Co., Reading, Pennsylvania.

14 FIELD GLASSES, TELESCOPES

FREE Catalogue! Thousands war surplus optical bargains. Lenses, Prisms, Telescopes, Binoculars, etc. Send $1.00 for 10 Lens Hobbyist Set and Project booklet. G. Jaegers, 691 West Merrick Road, Lynbrook, New York.

BUILD your own Reflector Telescope. Complete kit: Mirror, Eyepieces, Tripod, all other accessories. Request free illustrated literature. Criterion Manufacturing, Dept. KP-35, Hartford, Connecticut.

WAR Surplus bargains! Millions of lenses, instruments, telescopes, binoculars, components and complete line of astronomical telescope items. World's greatest optical market place! Send only $1.00 for beginner's 10-lens kit and big instruction booklet Stock 2-CN. Write for catalog-CN Free. Edmund Scientific Co., Barrington, New Jersey.

REFLECTOR Telescope Kits $7.25 (3") to $175.00 (12"). Mirrors, Cells, Focusing Mounts, Tripods, Eye Systems. Anything, everything in telescopes. Free Catalog. Also Ready to use telescopes from $25.00. Esco Products, Oakridge, New Jersey.

DYNASCOPE—Sensational New Reflector Telescope. Send for details. Criterion Company, Dept. DS-41, Hartford, Connecticut.

AMAZING prices, precision binoculars. Folder "Binocular Selecting," catalog free. Dealers write. Prentiss Importers, Mercury Bldg., West Los Angeles 25, California.

MICROSCOPE Catalog Free. Research Scientific Supplies, 126 West 23rd Street, New York 11, N.Y.

BINOCULARS, telescopes, microscopes. Terrific values $3.98 up. Request free money-saving catalog. Criterion, Dept. S-58, Hartford, Connecticut.

TELESCOPE Mirror Kits. 3", $4.95; 4½", $6.95. Postpaid. Lewis, Howell 11, Michigan.

ASTRONOMICAL Books, Star-Atlases, free list. Herbert Luft, 69-11 229th Street, Bayside 64, New York.

REFLECTING Telescopes completely assembled. 60X, $29.75. Guaranteed Observatory clearness. Free information. Skyscope, 475 Fifth Avenue, New York 17.

400 POWER Telescope easily made. Kit includes focusing tube, erector, five finished lenses, building instructions, $3.75. Suffolk Science, Mattituck 9, New York.

15 SPORTING GOODS, GUNS, FISHING TACKLE, ARCHERY, TRAPPING

180 PROFUSELY illustrated pages, antique pistols, swords, daggers, armor, etc. 50c. Robert Abels, PS860 Lexington Ave., New York 21.

FREE—Giant 1957 Wholesale Sporting Goods Catalog. Lowest wholesale prices. Complete line of cameras, sporting goods, appliances, outdoor items. Write today, Santa Fe Distributing Co., 1321 Main St., Dept. PS, Kansas City, Missouri.

SKIN Divers—dive for profit! New underwater metal detector locates sunken outboard motors, cameras, etc. Waterproof, self-contained unit, illuminated meter. Free information. Goldak, 1540 W. Glenoaks, Glendale, California.

FREE 152 Page Fishing Catalog—Includes latest "Do It Yourself" kits. Netcraft Company, Dept. A9, Toledo 13, Ohio.

FREE—Over 108 trade secrets other firms refuse to tell. With Giant 100 page Archery Catalog. Mail today 25c coin, stamps, to cover handling. Kittredge Archery Co., Dept. M, South Pasadena, California.

COLTS—Remingtons—Winchesters—Lugers—P-38's—Kentuckies—Springfields—Antique—Modern Guns & Guncessory Values—Big Bargain Catalog 50c. Agramonte's, Yonkers 2A, N. Y.

MOLDS for Fisherman's Sinkers, Jigs, Squids, Casting and Spinning Lures. Free Catalogue. Sweet's Molds, Tonawanda 3, New York.

JAP rifles altering American shells $6.00. Jap shells $3.95, catalog 5c. TP Shop, West Branch 10, Michigan.

POPULAR SCIENCE OPPORTUNITIES

BOWLERS—Professionally proven tips, tricks bring high scores. $1.00. Bowlaid, Box 383, Hellertown, Pa.

16 CAMPING EQUIPMENT & TENTS

TENTS, world's largest selection, direct from manufacturer. Send 20c for 136 page Tent, Camping Equipment Catalogue-Handbook listing all national camping sites. (Print name—address.) Morsan, 10-15G 50th Avenue, Long Island City 1, New York.

17 DOGS, BIRDS, HAMSTERS, RABBITS & PETS

HAMSTERS—Golden, young, $3.00 pair. Fully developed, $4.00 Pair. Adirondack Hamstery, Prospect 13-J, New York.

RAISE rabbits for meat, fur and laboratory. Booklet gives details. Wilson's Rabbitry, Greer 2, South Carolina.

NATURALIST'S Catalog 25c. 200 Mealworms $1.35. Gecko $2.50. Quivira Specialties, Topeka 10, Kansas.

WILD Pets—Mammals, birds, reptiles, amphibians, curios. Catalog 10c. Ray Singleton, Rattlesnake, Florida.

RAISE rabbits on $500 month plan. Plenty markets. Free details. White's Rabbitry, Delaware, Ohio.

ANGORAS, Chinchillas—World's most profitable rabbits! Particulars free. Grinsteads, Edwardsville, Illinois.

RAISE Mink: Free booklet, pen plans, inside "secrets," feed, care. Mink are money makers. Investigate today. Lawrence Molgard, Brigham City 13, Utah.

WE Pay $3.50 lb. dried. Grow Mushrooms. Cellar, shed and outdoors. Spare, full time, year round. We have 25,000 customers. Free Book. Washington Mushroom Ind., Dept. 177, 2954 Admiral Way, Seattle, Wash.

HAMSTERS—Ideal Pets. Young golden pairs $2.95, Breeders $3.95. Free booklet. Jer-Fre's Hamstery, 2425 Hoyt, Muskegon Heights 14, Michigan.

18 EARTHWORMS & FROGS

$10,000 YEAR possible, earthworms. 32 Page booklet, tells how 35c. Missouri Earthworm Research, Box C-6851, Kansas City, Missouri.

19 FARMS, OTHER REAL ESTATE

FLORIDA—Nice homesites, $345 at $10 monthly. Folder Free. Winfree Vernor, DeLand, Florida.

NEW Strout Fall Catalog. Just Out! Mailed Free! Over 3100 bargains, 34 States, Coast-to-Coast. Farms, Homes, Businesses; World's Largest! 57 Years Service. Strout Realty, 251-ZB 4th Ave., New York 10, New York.

TEXAS Land Near Mammoth Lake. Excellent Fishing and Hunting. Ideal Climate, Rich Soil, Gardening, Flowers, City Water, Phones, Electricity. Total Cost Per Tract Only $179.50. $5.00 Down Payment, $7.50 Monthly. Title Policy. Write for Free Photos, Maps. Hugh Matlock, Dept. Z47, Pipe Creek, Texas.

FLORIDA—Delightful living, near Gulf, on bays, bayous. Brochure. Chamber of Commerce, Lynn Haven 7, Florida.

20 TREES, SHRUBS, ROOTS, HERBS

GINSENG, Goldenseal Roots bring up to $14 pound. Full information. F. G. Collins, Viola, Iowa.

GROW, Pot, Sell. 7 imported Dwarfs. Instructions, Seeds $1.00. Mail Order Specialties, 1439-PS Sabraton Ave., Morgantown, West Virginia.

21 POULTRY & SUPPLIES

RAISE pheasants on $100 week plan. Little capital and space can make you independent. Free details. Great Central System, Columbus 6, Kansas.

22 PROFITABLE OCCUPATIONS

$5000 FROM Half Acre growing Ginseng, crop bought. Particulars 10c. Associated Growers, Sperling, Manitoba.

SAVE Money! Buy Wholesale! Free Catalog General Merchandise. Norris, 487-H Broadway, New York.

FREE "$5,000-$45,000; Unlimited Vacations." Work home! No merchandise, equipment! Haylings-PS, Carlsbad, Calif.

MAKE Money Writing Short Paragraphs! No tedious study. I tell you what to write, where and how to sell; and supply list of editors buying from beginners. Many small checks add up quickly. Write to sell, right away. Send for free facts. Benson Barrett, Dept. C-86-J, 7464 Clark, Chicago 26.

BUY Wholesale! Over 10,000 Nationally Advertised Products. Appliances, Cameras, Sporting Goods, Housewares, Watches, Typewriters, Tools, Clothing, etc. Send Postcard Today. Buy-Rite, Box 258, Hawthorne 7, New Jersey.

DISPLAY work. Window Trimming. Learn to use crepe paper and other materials. Good full or spare time income. Uncrowded field. Send $2.00 for full instructions. Jem, P.O. Box 144, Cranford, N. J.

FREE Book "505 Odd, Successful Businesses." Work home! Pacific—37C, Oceanside, Calif.

BIG Profits in Welding. Easy to learn. Low cost training in completely equipped Non-Profit school. GI Approved. Write for Free Booklet—Hobart Trade School, Box P-973, Troy, Ohio.

FREE Folder, "How To Make $3,000 Yearly Sparetime, Backyard, Raising Earthworms!" Oakhaven-7, Cedar Hill, Texas.

VENDING Machines—No Selling. Operate A Route of Coin Machines And Earn Amazing Profits. 32-Page Catalog Free. Parkway Machine Corporation, Dept. 17, 715 Ensor Street, Baltimore 2, Maryland.

THEY Hand him $100. Free Packet. "Secret Journal." 919 secrets—plans! Work home. Publico-E, Oceanside, Calif.

LEARN Invisible Reweaving At Home. Free Details. Jack's Service, P.O. Box 3451, Freeport, Illinois.

INDEPENDENCE, write for information, you'll be glad you did. Chamberlain, Box 173, Hickaville, Ohio.

BIG Money raising fishworms and crickets. Free Information. Carter Farm-10, Plains, Georgia.

$60.00 WEEKLY sparetime. Start home Venetian Blind Laundry. Protected Territory. Interesting information free. Burtt, 2434EX, Wichita 13, Kansas.

REPAIR Porcelain on Appliances. Much Needed Service! Profitable! Free Information. Porcelain Repair, 466 Potomac, Buffalo 13, New York.

"55 IDEAS For Making Money At Home." $2.00. Aetna Enterprises, 4604—2 Ave., North, Great Falls, Montana.

WE Pay $3.50 lb. dried. Grow Mushrooms. Cellar, shed and outdoors. Spare, full time, year round. We have 25,000 customers. Free Book. Washington Mushroom Ind., Dept. 101, 2954 Admiral Way, Seattle, Wash.

IF you have a product or service that can be operated on a mail order basis, write me today. I will send you a Free Kit on "How To Make Money Out Of Classified Advertising". Next issue will be November. Closing date September 24th. Hurry—Do it Today! O. K. Kelly, Classified Adv. Mgr., Dept. 97, 353 Fourth Avenue, New York 10, N. Y.

23 BOOKS & MAGAZINES

GOOD Used Books, 50c-$1. Free Lists. Editions, Dept. PS, Hempstead, New York.

WE want to buy old copies of Popular Science—any issue from period 1890 to 1915. Condition not too important provided books are complete with no pages removed. Write to Box No. 308, Tuckahoe, New York.

BACK Issues Supplied. Reasonable. Stratford Magazines, 354 Palisade Avenue, Jersey City 7, New Jersey.

BRITISH Book Bargains. Any subject. Catalog free. Transbooks, Box 1-PSU, Wantagh, New York.

SAVE—Make money. How-to books. List free. Young, Box 726, Detroit 31, Michigan.

BOOKHUNTERS! Scarce, Rare, Miscellaneous Books. Atlantic Book Service, 10 Cedar, Charlestown 29, Massachusetts.

NATIONAL Geographic Magazines 1888-1952. Any issue. Periodical Service, Box 465-PS, Wilmington, Delaware.

BOOKS Swapped. All kinds. Ford Thompson, 9900 Parkgate, Cleveland 6, Ohio.

24 HYPNOTISM

FREE Illustrated Hypnotism, Selfhypnosis Catalogue. Write: Hypnotist, 8721 Sunset, Hollywood 46P, California.

HYPNOTISM! Party Demonstrations. Neige E. Diehl, Route #3, Staunton, Virginia.

BEGINNER'S Hypnosis . . . illustrated . . . $1.00 Moneyback Guarantee. Baltimore School of Hypnotism, Dept. 79C, Box 6229, Baltimore 6, Maryland.

FREE Catalog! Hypnotism! Selfhypnosis! Auto-conditioning! Hypnotherapy! Books, Tapes, Courses, Recordings, Accessories! Drawer PS9-697, Ruidoso, New Mexico.

LEARN Hypnotism—our book 25 lessons in Hypnotism shows how to achieve business and social success. $1 postpaid. Satisfaction guaranteed. Books Publishing Co., Amityville 29, New York.

DIPLOMA. Degree correspondence courses. Hypnotherapy, Psychology, Science. Aureca, Central Valley, New York.

25 MAGIC TRICKS, PUZZLES, ETC.

500 TRICKS. Douglas famous 120-page Catalog, only 10c. Fastest service to magicians for 30 years. Send 10c today. Douglas Magicland, Dept. 2, Dallas, Texas.

WORLD'S finest professional magic. Joker novelties. Giant illustrated catalog 10c. Top Hat, Evanston 13, Illinois.

3100 NOVELTIES, Jokes, Tricks, Gadgets, Funmakers, Hobbies. Big catalog 10c. Johnson-Smith, D-423, Detroit 7.

STINK Bombs. Disgustingly potent 12/$1. Kits, 1450 Drake, San Pablo 10, California.

MAGICIANS, Gamblers winnings exposed. Cards, Dice, Slot, Pinball. Catalog 10c. Box 671, St. Louis 1, Missouri.

HINDOO Rope Trick And Magic Catalog 25c. Hocus Pocus, 317 North State, Jackson, Mississippi.

BE a magician! Large professional catalog of latest tricks, 35c. Ireland, F-109 North Dearborn, Chicago 2, Illinois.

FREE Disappearing Cards with Bargain Catalog 500 Tricks 10c. Ward, 60 East 42nd, New York.

COMPLETELY Illustrated 500 Trick Magic Catalog 25c. Stowell's, Woodstock, New York.

E-Z Magic Catalog 25¢. Eastern, P.O. Box 81, No. Westport, Mass.

POPULAR SCIENCE OPPORTUNITIES

SENSATIONAL Magician's Wand (Vanishes Handkerchief!) 25c, catalog included. Box 1352-PS, Philadelphia 5.

WHOLESALE! Thirty 10c Trick Novelties $1.00! (Profits!) 1746-SW Market, Philadelphia 3.

DOLLAR Magic Set Free with Catalog 25c. 4462-PS Germantown, Philadelphia.

SMOKEBOMBS 25c, 7 for $1.00. (Terrific!) 4463-PS Greene, Philadelphia 44.

"VENTRILLO" Professional Voice Thrower and Catalog 25c! Box 971-PS, Philadelphia 5.

26 COINS & CURRENCY

COINS from Formosa, Vatican, etc., plus foreign banknote, 10c with coin approvals. Littleton Coin Company, Littleton 52, New Hampshire.

GET Profit and Pleasure in collecting old coins. Send 10c for 56-page illustrated coin catalog. You'll be delighted with it. Send for it now. B. Max Mehl, 374 Mehl Building, Fort Worth, Texas. Largest rare coin establishment in U. S. Established 57 years.

12 DIFFERENT Indian Pennies, $1.00. "Coins," Box 6184, Albuquerque, New Mexico.

"VALU-Packed" American coin catalog, 10c! Sullivan's, 127-ZB East Fourth, St. Paul 1, Minnesota.

$300 FOR certain U.S. Pennies. List 20c. Blewitt, 5604 Front Street, Verona, Pennsylvania.

WILL buy U.S. Coins. Paul Thome, 1786 Montrose, Concord, California.

THREE Different Barber Halves $2.00. Bargain Lists Free. Sayers, 1000 Unaka, Johnson City, Tennessee.

FREE! Foreign coin banknote and Coin Collectors' Illustrated Catalog to approval service applicants. Send 3c postage. Tatham Coin Co., Springfield-50, Mass.

START Your Own Coin Collection. Information and Price Lists Free. Louis Bell, Box 1575, Decatur, Alabama.

AUSTRIA, Switzerland, Belgium, Mexico's Coins—10c. Jolie Coins, Roslyn Heights, New York.

U.S. Proof Sets: (Mint Packages) 1953—$15.00; 1954—$8.00; 1955—$6.50; 1957—$3.00. U.S. Gold: About uncirculated, Indian Head, $2½, $10.50; $5, $15.00. Postpaid. Guaranteed. J and N Coin Company, RR 1, Box 257P, New Augusta, Indiana.

LINCOLN, Indian Cents, all dates. 1955S Cent uncirculated and complete pricelist 25c. Penny Mart, CK-7, Box 629, Chicago 90.

COIN Magazine, 160 pages. Sample 35c. Numismatic, 7320 Milwaukee, Chicago 31.

12 DIFFERENT Indian Cents, and Coin List only $1.00. Pounds, Box 231J, North Wales, Pennsylvania.

BARGAIN lists, Indianhead cent, 10c. Economy Sales, 156-B Dean, Mansfield, Mass.

ONE Million Dollars Confederate Money in $10's, $20's, $50's, $100's etc. only $2.98. Limit four million for only $10.00. Best Values Company, Dept. 3, 401 Market Street, Newark, New Jersey.

LINCOLN Cents 1910-S, 1913-S, 1921-S, 1923-S, 1924-S all for $2.00. Gasser's Box 34615, Los Angeles 34, California.

INDIAN Cents—15 different $1.45. General MacArthur Set $3.25. 1958 Guidebook $1.75. Bebee's, 4514 North 30th, Omaha 11, Nebraska.

MORGAN Dollars; 1878-87-89-90-91 $2.00 ea. Catalogue 25c. Shultz, Salt Lake City 10, Utah.

SILVER Dollars: Uncirculated. 1880o through 1885o $3.50 each. 1893cc $15.00. Retail lists 10c. Holden's, Garwin, Iowa.

10 MIXED Foreign Coins—Bills: 10c. Dwight Musser, Dunbar, West Virginia.

44 DIFFERENT Uncirculated Coins, $1.00. Oddchon, Box 482, St. Louis, Missouri.

5 DIFFERENT Barber quarters $1.00. Price list free. Joray's, Box 38, Shouns, Tennessee.

IF you have a product or service that can be operated on a mail order basis, write me today. I will send you a Free Kit on "How To Make Money Out Of Classified Advertising". Next issue will be November. Closing date September 24th. Hurry—Do it Today! O. K. Kelly, Classified Adv., Mgr., Dept. 97, 353 Fourth Avenue, New York 10, N. Y.

28 STAMP COLLECTING

TWO $5.00 US stamps plus 20 different, 10c with US approvals. Irwin Stamp Co., Box 1109, Brooklyn 30, New York.

AMAZING Offer! 200 U.S. stamps—including commemoratives, airmails, high denominations to $1.00—only 10c to Approval Applicants!! Illustrated Bargain Lists free. Mystic Stamp Co., Dept. 55, Camden, New York.

U.S. Classics—Over 50 Yrs. Old. 15 Selected oldtimers. Missing in biggest collections. All 15 at less than 1c each. 10c with approvals. Jaro, Box 246-P, New York 8.

ICELAND 10 different beautiful stamps for only 10 cents to applicants for our good old fashioned approvals. Old Colony Stamp Co., Dept. B, Milford, Conn.

UNITED States commemorative collection containing 33 different—10c. Approvals. White, 516-W Avenue L, Brooklyn 30, New York.

WEIRD Diamond Shape Coffee Stamps. Lovely Flower Triangle! First American big commemorative. Greenland, Idol Dancer, etc. Free with approvals. Capital Stamp Co., Ferrysburg 10, Michigan.

30,000 DIFFERENT 1½c each! Build biggest collection—as fast as you like. Start Now! Free details. Huppert, 1972 E. 18th Street, Brooklyn 29, New York.

"WOW!" 135 All Different Germany 10c. Big collection includes old Zeppelins. Semi-Postals, Airmail, High Values, Giant and Midget-sized Stamps. Extra! Complete bargain catalog, free booklet. Approvals. Jamestown Stamp Company, Dept. A9PSC, Jamestown, New York.

225 STAMPS For only 10c! This mammoth value includes Airmails, Pictorials; stamps from strange Countries cataloguing up to 25c each! Also Approvals. Mystic Stamp Company, Camden 55, N. Y.

FREE! 107 British Colony Stamps. All different, from Britain's farflung colonial empire. Catalog value $2.50. Free Stamp Magazine, Approvals. Send 10c for handling. Act now! Niagara Stamp Co., St. Catherine's 72, Ontario.

FREE! Amazing List! Two Feet Long! All Countries! Stampmart Company, Hartford 1, Connecticut.

FREE! Giant catalog offering thousands of bargains. Sent with beautiful approvals. Jamestown Stamp Company, Dept. E9PSC, Jamestown, New York.

SENSATIONAL U.S. U.N. illustrated catalog free. Stone, 192 Washington, Boston 8, Mass.

200 DIFFERENT including F. D. R. Triangle also scarce War Ration Stamps. 10c to approval applicants. Avalon Stamp Co., Dept. S, Springfield, Mass.

200 WORLDWIDE 25c plus surprise packet. Packet list free. Econopackets, Box 168, Riverside 22, Calif.

FREE Packet! Angola, Azores, Mongolia, Nepal, Palestine. Fascinating Approvals. Coral, Box 7095, Ludlam, Miami 55, Florida.

RED China, 25 fine different unused, 3c. Approvals. Jim's, 1317 Apple, Silver Spring, Maryland.

STAMP Finder, World Map and Encyclopedia of stamp issuing countries only 5c. Approvals. Goliath Company, Bethlehem K2, New Hampshire.

GIGANTIC Collection Free — Includes Triangles—Early United States—Animals — Commemoratives — British Colonies — High Value Pictorials, etc. Complete Collection plus Big Illustrated Magazine all free. Send 5c for postage. Gray Stamp Company, Dept. PR, Toronto, Canada.

WORLDWIDE Mixture, 500, 25c. Arthur Sibley, Box 222, Uxbridge, Massachusetts.

FREE!! Absolutely Free! Fantastic Fish Triangle. Approvals. Beaman, Dayton, Tennessee.

MAGNIFICENT Display, 10 Different Sports, Free!!! Approvals Accompany. Brightwood, Box 93, Nashville 1, Tennessee.

"HOLY Land" Triangle, Macao, Timor beauties, 26 others, 3c. Approvals. Boice, 1717 Marshallfield, Redondo Beach, California.

"ABE Lincoln" Giant Diamond, rainbow colored Flag Set, Israel, South Korea, 50 others different, only 10c. Approvals. Champlain Company, Isle La Motte, Vermont.

EXCITING Surprise Lots 25c, guaranteed value, approvals accompany. Beacon, Box 161B, Woodside 77, New York.

MIDGET Triangle, Giant Diamond, Timor, 26 others, 3c. Approvals. Carpenter, 306 South Mills, Claremont, California.

307 DIFFERENT Stamps 25c, including India, China, Vatican, Russia, British Colonies, Japan, Africa, Scandinavia, Pakistan, Newfoundland, Australia, Exceptionals, Unusuals. Only with approvals. Lincoln Stamp Company, St. Catherine's 219, Ontario.

FIRST U.N. Set Among World's Prettiest. Only 10c. Approvals. Welles, Box 1246-V, New York City 8.

ABSOLUTELY Free!! Giant, Midget Triangle Beauties!! Approvals. Weintraub, 325 East Houston, Tyler, Texas.

COLLECTION Monaco stamps featuring Wedding of Princess Grace Kelly; also Presidents Eisenhower, Lincoln, Washington, Roosevelt & others. Only 10c to introduce approvals. Littleton Stamp Company, Littleton B2, New Hampshire.

BEST Buy Today! 1000 Different Worldwide Stamps $1.00. Universal, Box 6, Kenosha 6, Wisconsin.

FREE—Mint British Colonies from North Borneo, Caymans, Seychelles, Dominica, Papua, New Guinea, Sarawak, Brunei. Free with approvals. Viking, Great Neck 5, New York.

WORLDWIDE, 50 all different, absolutely free, just to introduce our incomparable approvals. Kent Stamp Company, GPO Box 87, Brooklyn, N. Y.

SPECIAL: 100 Different Greece 30c To Approval Applicants. Northwest Stamp Service, Dept. PSM9, Box 37, University Station, Seattle 5, Washington.

FREE 60 Different Stamps With Approvals. Send 5c Postage. Stanley Zajac, 159 Emerson Ave. Toronto, Canada.

SPACEOPHOBIA? Our 1c—2c approvals cure quickly. BK&J, Astor, Boston 23, Massachusetts.

50 DIFFERENT Argentine, Free! Unusually Good Approvals. Arrow Stamps, Box 2575, Oklahoma City 8, Oklahoma.

POPULAR SCIENCE OPPORTUNITIES

SAN Marino And Other Sets, 10c Mailing Costs. Approvals. Rawls, 9098 W Swan Circle, Brentwood 17, Missouri.

IRAQ, Iran, Syria, Lebanon, Egypt, Israel, Free! Excellent Approvals. Panorama, Box 229, Miami 2, Florida.

GREENLAND, Monaco Princess, Triangle, 101 others. 10c to approval applicants. Mitchell, Box 1503, Arlington 3, Virginia.

DARKEST Africa!! Congo, Cameroons, Seychelles, Swaziland, Tanganyika, Urundi, Free!! Fascinating Approvals. Roysalton, Box 283, Forest Hills 75, N. Y.

100 DIFFERENT Austria 10c. Approvals. Irving Aronson, Box F, Newton Centre 59, Massachusetts.

125 DIFFERENT Canada, 65c. Orsini, Applegarth Road, Cranbury, New Jersey.

FREE ten mint British Colonies given approval applicants. Tropicana, Box 624-S, Oakland Park, Florida.

500 MIXED U.S. Stamps 15c. Wright, 201-P Mealey, Hagerstown, Maryland.

FREE, 50 different foreign. Approvals. C. Casto, Box 357, Dunbar, West Virginia.

EXTRAORDINARY Battery. U.S. Bargain. Price Lists 10c. No Approvals Accompany. David Chassy, Box 42, Babylon, New York.

TRANSPORTATION, Flags, Flower, Other Colorful stamps. Free to Approval Applicants. Delton Page, Box 201, East Paterson, New Jersey.

PENNY Approvals By Country. M. H. Hoerning, Merriam, Kansas.

GIANT Package 500 Worldwide Mixture 25c. Monjar, Fairmount, Cincinnati 14, Ohio.

SPANISH Sahara Animals, 6 Mint, 10c With Approvals. Park, Box 236, Floral Park, New York.

FREE! World Wide Collection. Approvals. Thurman, 10522 Ashbrook, St. Louis 15, Missouri.

100 FOREIGN, 20 U.S. Commemoratives, 10c. Approvals. Weckerling, 3210L Hancock, Austin 3, Texas.

BULGARIA: 50 Different Exciting Pictorials, Animals, Flowers, Trucks. This Valuable Collection, Just 15 Cents With Approvals. R. Charles Boger, P.O. Box 152, North Wales, Pennsylvania.

FIVE Different Sets French Colonies, 10c with Approvals. Banner, Box 65, Park Forest, Illinois.

ECONOMICAL ½-3c Approvals. 33,000 varieties. Dresel, Box 128-T, West Englewood, New Jersey.

$8.00 CATALOG Value Worldwide Stamps $1.00. Veteran Frank Stroskey, 223 Market St., Perth Amboy, New Jersey.

WINGED Wheel set plus 55 different free with interesting approvals. (5c) handling. Stamp Imports, Peterboro, Ontario, Canada.

FREE! Israel, Philippines, Monaco, Others. Approvals. Klein, Box 34S, Long Island City 6, New York.

100 OLD U.S. Stamps between 1861 and 1935 $1.00. Rousch Stamps, 51 Chestnut, Mansfield, Ohio.

FREE! Coronations, triangles, sports, animals, Monaco Fipex; given approval applicants. Exotic, Box 482-S, Coral Gables 34, Florida.

1000 DIFFERENT, $1.00 with approvals. Golden's, 6721 Eastwood, Philadelphia 49, Pennsylvania.

WORLD Smallest and strangest stamps only 10c with Approvals. Finney, Box 89, El Monte, California.

SCARCE Souvenir Sheet free with approvals. (Foreign.) Variety Stamps, 57-E Circuit, Newton Highlands 61, Massachusetts.

BRITISH Colonies, 100 Different 10c, also Free Albums, Catalogs for Purchasing Approvals. Coast, P.O. 2187M, Santa Ana, California.

123 DIFFERENT 10c including African Queens, Approvals. Krehl, 1708-S Nebraska, Orlando, Florida.

MONACO. New Princess Caroline Issue, 5 values only 15c with approvals. El Montecito Stamps, 1356 Danielson Rd., Santa Barbara, Calif.

FREE! Israel, Mozambique Company, Australian Commemoratives, Coronations, Egyptian Overprints, Monaco! Exciting approvals. Foxboro, Box 167, Foxboro, Massachusetts.

GOOD, Low Priced Approvals with Free Gift! LaRoche, Monticello, New York.

COMORRO, Hyderabad, Swazieland, Mauritania, Armenia, Nyassaland, Free; Bargain Approvals. Tamiami, Box 342, (Tamiami) Miami 44, Florida.

CANADA Collection on Approval. Enclose 10c. Peterson, 405 Empire Bank, St. Paul 1, Minnesota.

GIANT Approvals. Thousands Different 1c and 2c each. Wahl's Stamp Exchange, 7008K Farragut, Chicago 31, Ill.

40 AMERICAS, Commemoratives, Latins, British 10c; Penny Approvals. Whole sale Trades. Bristolt, Canton Center, Connecticut.

WONDERFUL Offer Seven complete mint sets only 10c with approvals. Reich (S26), 1033 Lawrence, Chicago 40.

WONDERFUL! Old U.S., Famous Americans, Flags, Presidents, Commemoratives, approvals plus surprise packet for 10c handling. Metropolitan Stamps, Box 312DC, Jackson Heights, N. Y.

PENNY Approvals jammed with Bargains. For better values, try Putnam Stamp Company, Mahopac, New York.

70 DIFFERENT U.S., including 35 Commemoratives 25c. No approvals. Seidenberg, Appleton, Wisconsin.

FREE! 55 British Colonies, 5c Handling. Kensington Stamps, Buffalo 15, New York.

UNITED States Catalog Free! Bailey Stamps, 45 Bromfield, Boston 8, Massachusetts.

205 DIFFERENT stamps 10¢. Approvals. Stampmaster, 2432 Fernwood, San Jose 8, California.

EIGHT Wonderful Monaco Triangles Five Cents. Approvals. Balter, Box 19464, Los Angeles 19, California.

NETHERLANDS Collection, 50 Different. Free! Bargain Approvals. Caribbean, Box 266, Shenandoah, Miami 45, Florida.

ZOUNDS!! Amazing "Strange -Countries" packet—3c with approvals! Saxon, Orange, California.

25 DIFFERENT Commemoratives 1893 up 10c. U.S. Approvals. K & B, Box 70, Brooklyn 23, New York.

MINT Monaco Nudes 10¢. Approvals. Barricks, 1600 Seward, Detroit 6, Michigan.

VIETNAM, Laos, Syria, Soudan, Mauritania, Fezzan, Free! Exciting, Inexpensive Approvals. R. & R. Stamps, Box 7, Walnut Ridge, Arkansas.

MONACO Grace Kelly "Motherhoods" given. Approvals. William Deems, Ravenswood, West Virginia.

1-2c EACH! Thousands of exciting worldwide stamps. Free examination. Cole, Box 223-G, Buffalo 21, N. Y.

SELECT U.S. on approval. Mint, used. Kingsbury Stamps, Fairfax, Vermont.

COLLECTORS Exchange, 36th successful year duplicate trading. Worldwide Stamp brings everything. 913 59th, Richmond 24, Virginia.

ITALY, 100 Different 10¢ With Approvals. DeRespinis, GPO Box 771N, New York 1, New York.

LUXEMBOURG, 25 Different 5¢ Approvals. Neal, 5950 Tower, Riverside, California.

MINT Collection cataloging $1.75 only 10¢. Approvals submitted. Philatelic Roundup, Pennington, New Jersey.

EXCHANGE stamps. Send 100-200 different foreign with 15c. Receive different. Patterson, Lancaster 12, New York.

10 CANADA Pictorials Free! Approvals. The Winfield Company, Box 135, Elizabeth, New Jersey.

FREE! Monaco Triangles! Madagascar! Zaragoza Pictorials! Approvals. Keating, 2520-M Boulevard, Jersey City, New Jersey.

KENYA—Queen set to 1/-. Free with approvals. Lee Hoover, P.O. Box 3594, Portland 8, Oregon.

GOOD Worldwide Stamps 1-3¢ Each. Mayers, 37 Dawson, Belleville 9, New Jersey.

SELECT U. S. and foreign approvals for building your collection. Laclede Stamps, 4670 Tesson St., St. Louis 16, Missouri.

JAPANESE commems, bi-colors, parks, 14 colorful stamps, only 10c. Approvals. Norton, Box 926, San Antonio 6, Texas.

FREE! Seven Short Sets! Approvals. Gernert, 4235-Y Alton, Louisville 7, Kentucky.

UNITED States. Fine Mint Airmails. #C7, #C8, #C9, #C10. Only $1.15. Approvals accompany. Whiton Paine, Westport 12, Connecticut.

GOLD! Silver! Persia's Spectacular 1909 Issue Mint Including Beauties Printed In Gold, Silver. Only Dime With Approvals. Wilhelm, 14646 58th Road, Flushing 55, New York.

START your own Stamp Business. Send for Free circular. Donald Shepard, Box 1147, Chicago.

IF you have a product or service that can be operated on a mail order basis, write me today. I will send you a Free Kit on "How To Make Money Out Of Classified Advertising". Next issue will be November. Closing date September 24th. Hurry—Do it Today! O. K. Kelly, Classified Adv. Mgr., Dept. 97, 353 Fourth Avenue, New York 10, N. Y.

29 ANTIQUES, RELICS & INDIAN GOODS

4 PERFECT Arrowheads $1.00. Smith, 841 N. Tacoma, Indianapolis 1, Indiana.

PREHISTORIC Indian Relics: Fifteen Arrowheads $3.00. List Free. Stan's, 1054 Lilley, Columbus 6, Ohio.

ANCIENT Arrowheads: fifteen $3.00. Spearhead $1.00. Book-Relic Catalog 50c. Tilton Relics, Topeka 10, Kansas.

SELLING 100,000 ancient Arrowheads, Spearheads, Tomahawks, etc. List free. Lear's, Glenwood, Arkansas.

30 MINERALS & PRECIOUS STONES

TEN Minerals $1.50, Six Fluorescents $1.00, Five Crystallized Specimens $1.00, Fools Gold 25c. Hartson, Winston 5, New Mexico.

EARTH Science, Rockhounds' National Magazine. Subscription $2.00. Sample 25c. Box 1357-PS, Chicago 90, Illinois.

POPULAR SCIENCE OPPORTUNITIES

SAPPHIRE, Topaz, tourmaline, garnet, peridot. Five uncut gem specimens. $1.00. Ten polished gems. Baroque shaped. $1.00. Free bargain list, jewelry, gems, profitable, easy "do-it-yourself" projects. O'Brien's, 1116B Wilcox, Hollywood 38, California.

GEMCUTTING — Silvercraft magazine. Learn to cut gems, make jewelry. Ads give sources equipment, gems for cutters, collectors. Free literature. Sample copy 25c. Lapidary Journal, Del Mar 3, California.

GOLD, Silver, Copper Ore With Catalog 50c Postpaid. Gemco, Eisner Avenue, Sheboygan, Wisconsin.

GEMSTONES, thirty, uncut, Ruby, Sapphire, Emerald, etc., $3.50. 50 minerals $5.00. Lists. Reed's, 4930A Palo Alto SE, Albuquerque, New Mexico.

LARGEST gem and mineral magazine tells how to have profitable fun with rocks, gems, jewelry. Monthly. $3.00 year. Sample 25c. Gems & Minerals, Dept. S-9, Mentone, California.

VIRGINIA Fairystones. Collectors Selection, $1.00. Virginian, Box 662, Inverness, Florida.

31 HOBBIES, COLLECTING

INVENTING can be an interesting and profitable hobby. Write for complete particulars. Institute of American Inventors, Dept. 30-E, 635-F St., N.W., Washington 4, D. C.

NAZI Badge 50c; Iron Cross with Ribbon $1.50; 35 American Emblems, introductory offer 50c; Catalog 10c—Hobbies, Box 71-B, Station "A", Brooklyn, New York.

SOUTH Seas items! Polynesian Out-Rigger Canoe Models. Beautiful Wood: 5"—$2.00, 8"—$3.00, 11"—$4.00. Hawaiian Gods Models: Sacrificial, $2.00; Four Different, $5.00; War God, $3.00; Spirit God, $4.00; Fortune Gods, $3.00. Orchids: From "Best Of Show". White Cattleya, 2"—$2.00, Dozen—$18.00. Guaranteed. Seedling List, $.10. Cash, Money Order. Pearl Harbor Trading Co., P.O. Box 317, Aiea, Honolulu, T.H.

STAMPS, Postmarks, Letterheads—100—25c. Benner, 299 East 162nd, New York City 7.

COLLECTORS Matchbook covers. 100 Different unused $1.00. Catalog 25c. Album $3.00. Charles Edelman, 1311-P East 84, Cleveland 3, Ohio.

32 PHOTO FINISHING, PHOTOCOPIES, ETC.

PARTICULAR? 8 Jumbos, 35c; 12—50c. Special: 35mm. 36 exp. $1.25. Flash Foto, Box 36H, Brooklyn 4, N. Y.

FREE 5x7 introductory enlargement with roll. Finest quality Jumbo dated prints in handy super paks. 8 exposures 35c; 12, 50c. Complete color processing. Big Discounts! Write Globe Photo, Dept. PS, Box 3508, St. Paul, Minnesota.

12 EXPOSURE Rolls, 39c. Jumbo prints. Guaranteed work, one day service. Lincoln Studios, Dept. L, Box 13, Lincoln, Nebraska.

8-HOUR service on deluxe jumbo prints. 8-Exposure roll developed and 8 jumbo prints 40c, 12 exposure 55c, 16 exposure 70c; 35 mm. 20 exposure 75c, 36 exposure $1.25. Jumbo Deckledge Reprints 4c each. Contact prints made if specified. Bay Photo Service, P. O. Box 210, Oakland, California.

33 MOTION PICTURES, SLIDES SOUND EQUIPMENT

MOVIE Camera Film 8 mm roll $1.50. 16mm 100' $3.00. Free processing. Better Films, 742 New Lots, Brooklyn, N. Y.

SAVE 50%! Guaranteed-fresh color, b&w movie film! 8mm, 16mm. Free catalog! Eso-H, 47th Holly, Kansas City 12, Mo.

FREE catalog. Save $$$. Fresh 8mm, 16mm B&W and color film. Home processing equipment. Superior Bulk Film Company, 442-448 No. Wells, Chicago 10.

RECORDERS, HiFi. Free catalogue. Carstone, 215 E. 88 St., NYC 28.

FREE! Blackhawk's big new 1958 sale catalog new and used 16mm., 8mm. movies; 2"x2" color slides; used 16mm. sound projectors! Biggest stock in USA! Cameras, accessories, supplies, too! Blackhawk Films, Davenport 15, Iowa.

FREE Catalogues. 5,000 8-16MM Films. International Films, Greenvale, New York.

TAPE recorders, tape. Unusual values. Free Catalog. Dressner, 69-02 174 Street, Flushing 65, New York.

8MM Movies 50 ft. $1.00 Special Offer Animals, Cartoons, Travel, Comedies. Send $1.00. Movieland Films Inc., 16121-S Sherman Way, Van Nuys, California.

SAVE Hi-Fi Sets, Records, Etc. Hi-Fi, 150 N. Sunrise, Bowling Green, Kentucky.

34 CAMERAS, PHOTO SUPPLIES

PHOTOGRAPHY For Pleasure or profit. Learn at home. Practical basic training. Long established school. Free booklet. American School of Photography, 835 Diversey Parkway, Dept. 1726, Chicago 14.

CHECK our low prices on all photo equipment. Trade-ins accepted. Write for free estimate. Rembrandt Camera Shop, 29 West State St., Sharon, Pennsylvania.

FREE Catalogue Wholesale Photo Supplies. Mel-Jo, P.O. Box F, Hillside, New Jersey.

35 MUSICAL INSTRUMENTS, SONG WRITERS & RECORDS

WANTED! Poems for musical settings. Write Songwriters' Service, Clifton, N. J.

POEMS Wanted For New Songs. Send Poems. Free Examination. Immediate Consideration. Songcrafters, 2724 Arcade Station, Nashville, Tennessee.

SONGPOEMS and lyrics wanted. Mail to: TinPan Alley, Inc., 1650 Broadway, New York 19, N. Y.

SONGWRITERS! Protect your ideas! Hold all poems, songs! Write for safe, correct procedure! Song Service, Dept. PS, 333 W. 56th, New York 19.

POEMS wanted for new songs. Send poems. Immediate consideration. Crown Music Company, 49-P West 32 Street, New York City.

SONG Poems Wanted. Five Star Music Masters, 646 Beacon Building, Boston.

NEW Songwriters. Songpoets share $29 million dollars yearly. Songs composed, published, promoted by largest firm. Information, appraisal Free. Send Nordyke Publishing, 6000 Sunset, Hollywood 28PS, California.

COMPLETE Music Service For Amateur Songwriters. Jerry Colonna, Box 888, Burbank, Calif.

ACCORDIONS Wholesale—10 day trial. Free Catalog. American Accordion Center, 5329-PS-9 Belmont, Chicago.

ACCORDIONS—Direct from importer—save 50% and more! Free trial. Lifetime guarantee. Trades accepted. Free Catalog. Write Accordion Manufacturers Outlet, Dept. 97P, 2003 Chicago, Chicago 22.

LET Me Start You On A Songwriting Career. Details Free. Johnnie Martinelli, 1182 Broadway, New York City, Dept. 7A.

MUSIC printing lowest rates—get samples. Auto-Litho, Jensen Beach 2, Florida.

VIOLIN Makers Supplies. Free Catalog. 309 W. 4th Street, Los Angeles 13, California.

PHONOGRAPH Records Cheap, postpaid. Catalogue. Paramount, Box 242-S, Williamsport, Pennsylvania.

ELECTRIC Guitars, amplifiers, wholesale. Free catalog. Carvin, PSM, Covina, California.

SONGWRITERS, Singers, Combos. Interested in investing $650 to get two numbers on recognized label? Details, sample record, $1.00. Records, 155 W. 46, New York 36.

DISCOUNTS Instruments accessories national brands. Tempo Music, 27 Cutler, New London, Connecticut.

36 RADIO, TELEVISION, SUPPLIES & EQUIPMENT

TV Sets—10 to 21"—$12 up, catalog available others. Surplus Appliances, RFD 2, Abele Park, Putnam Valley, New York.

FREE! Giant Bargain Catalog. Transistor, "Sun" Radios, Kits, Portables, Audio, Electronics, Photographic, Optics, Tools, Household. Write Lektron, 1318 Everett Ave., Chelsea, Massachusetts.

FREE 404-Page 1958 Radio-TV-Hi-Fi and Electronics Catalog! World's largest stocks, lowest prices. Everything for experimenters, builders, amateurs, servicemen. Latest money-saving build-your-own Knight-Kits. Hi-Fi, phonos, recorders, Public Address, TV accessories. Thousands of parts, tubes, test instruments, tools and books. Write for Free copy! Allied Radio Corp., 100 N. Western Ave., Dept. 31-J7, Chicago 80, Illinois.

KITS—Shortwave Radio $3.50—Crystal Radio 60c. Alliance, 2059 60th, Brooklyn 4, New York.

CRYSTAL—Radio experimenters. Write to Hulet, 305 Hope, Lakewood, New Jersey.

CRYSTAL Radio kit $1.00, preassembled $1.25, phone $1.75, catalogue. Clearco Crystal Company, 2966 North 4th, Milwaukee 12, Wisconsin.

ANY Schematic, $1.00. Return mail. Brown, 78-A Walnut, Philadelphia 44, Pennsylvania.

"20 CRYSTAL Set Plans" Handbook 30¢. Laboratories, 328-T Fuller, Redwood City, California.

YEAR-Guaranteed pre-tested new tubes, discounts to 80%, tremendous stock, transmitting, special purpose tubes, write Bell Electronics, 40 Canal, New York City 2.

37 BUSINESS OPPORTUNITIES

OPERATE profitable mail order business. Write Walter Service, 4158-B East 112th, Cleveland 5, Ohio.

BREED Rare Tropical Fish at home. Earn Big Money! Learn Secrets! Help fill huge demand. Amazing Opportunity! Free Plan. Tropical Fish Breeders, Los Angeles 61, Calif.

BE appointed state notary public now. Write—Stationers, Boerne, Texas.

FIX Typewriters. Inexpensive home course teaches Factory Secrets. Free Booklet. Write, Typewriter, Tarentum 2, Pennsylvania.

WHOLESALE—Get the big merchandise-furniture, appliances, TV's, clothing, tools, auto accessories—most anything. Save half. Literature Free. Associated Wholesalers Service, 1016-C Starr, Burlington, Iowa.

BRUSH Plating Outfits for plating articles in the home and shop. No tanks necessary. Silvering Mirrors spare or full time. Free particulars. Gunmetal Co., Ave. E, Decatur, Illinois.

$70 WEEKLY—Home, spare time. Simplified mail bookkeeping. Immediate income—easy! Auditax, 34757D, Los Angeles 34.

11,000 NEW Prospects Daily. Baby record books, shoes, albums. Sell mailorder. Use our literature. Write: No-Co-Ro, Capitola, California.

POPULAR SCIENCE OPPORTUNITIES

GROW Expensive Herbs for Us! Big Profit Home-Business of your own. Year around profitunity. We supply everything necessary! Send for Free Rare Seeds And Revealing Plan. National Herb Exchange, Dept. SR, Gardena, California.

YOUR envelopes addressed accurately, reasonably. Fast service. We have capable addressers in your city. Glenway System, Box 6568, Cleveland 1, Ohio.

LEARN Photo-Negative (Portrait) retouching. Men, Women $5 hour possible spare or full time at home. Easy, glamorous. Work for Photographers by mail order. Full details sent Free. Duval, 100 South Vermont, Los Angeles 4.

MAKE Extra Money. Cash commissions. Everybody buys easy-to-sell Advertising Book Matches. Union label. Big variety—Glamour Girls, Scenics, Hillbillies. Powerhouse selling kit Free. Steady repeat business. No experience necessary. Superior Match Company, Dept. PX-957, 7528 S. Greenwood, Chicago 19.

YOUR Own name brand business. No investment; no inventory. Part time or full time. Sell famous brands of appliances, housewares, silverware, radios, vacuum cleaners, lamps, tools, clocks, watches, jewelry, etc., etc., over 1,000 items. Join thousands of successful independent dealers. Send for Free catalog and dealer price list. H. B. Davis Corp., Dept. 14, 145 W. 15 St., New York City.

PRINT for Profit at home. Amazing new method prints colorful posters, banners, greeting cards, glassware—anything. Hundreds at time. No press needed. No art. Fantastic profits! Need representative your area immediately! Free home-business plan. Screen-Print, Dept. SR, Los Angeles 61, California.

PLATE Baby Shoes, jewelry, gifts, bronze and colored pearl. Free booklet. Anderson, 11029 South Vermont, Los Angeles 44.

GROW Orchids at home—profitable—fascinating. Year 'round, Maine to California. No Greenhouse. Successful home grower shows you how to provide proper temperature and air conditions in any well lighted room. Full details & real Orchid Seeds Free. Orchidland, 100 So. Vermont, Los Angeles 4.

START your own subscription service. Every family buys magazines. No capital needed. We tell you how, furnish all supplies Free. Liberal commissions. Write McGregor Magazine Agency, Dept. 130, Mount Morris, Illinois.

MAKE Money Growing Miniature Trees on your Window Sill. Free Seed and Plan. Miniature Nurseries, Dept. SR, Gardena, California.

HOME-Import Mail Order Business—Import profitable items below wholesale. Experience and product investment unnecessary. Full, spare time. Famous world trader guides you. Free list "157 imports" details. Mellinger, G699, Los Angeles 24.

ELECTRONIC Plating Equipment, Anodes, Solutions. All types, including New Electroless nickel. Baby Shoe Metallizing Equipment, Supplies. Free Catalog. Hollywood Bronze Supply, Dept. B-1, 1624 East First, Los Angeles 33, California.

"HOW to Start a Business" booklet sent Free! If you Know any Trade—go into business for yourself! Learn the 9 easy steps to follow. We've guided 5,000 others to success. Revealing Free Booklet yours for the asking! Write! National Business Consultant, Office SR, Los Angeles 61, California.

MAIL Order—advertising agency executive reveals sensational no-risk advertising and merchandise methods. Start in office or home—minimum capital—positive profits. Free details; Impact! 3407 Prospect Ave., Dept. 2-9, Cleveland 15, Ohio.

FREE sample lesson proves you can learn T.V. servicing in one week. Simplified, chart method saves $200 on training. Amazing! Write Electronic Engineering, Dept. AC-189, 1038 S. LaBrea, Los Angeles 19, California.

EXCLUSIVE Distributorship available in most areas for world-famous Cadmium Battery guaranteed to outlast your car. Tremendous profit opportunity. Investment for merchandise only. Free franchise. Cadmium Battery Corporation, Dept. 103, El Segundo, California.

BUY Wholesale! Over 10,000 Nationally Advertised Products. Appliances, Cameras, Sporting Goods, Housewares, Watches, Typewriters, Tools, Clothing, etc. Send Postcard Today. Buy-Rite, Box 258, Hawthorne 5, New Jersey.

PAINT suede on dashboards, signs, radios, toys, figurines—anything! Amazing new discovery finish with beautiful touch and eye appeal. $10 per hour possible for spare time effort at home. Help fill the huge growing demand. Free actual sample and "150 Home-business Ideas" booklet. Coast Industries, Dept. SR, Los Angeles 61, California.

FREE Catalog. Contains hundreds of businesses, farms and income properties throughout U.S., Canada. Specify type and location desired. Deal direct with owners. U.I. Buyers Digest, 1608 Hillhurst, Dept. PS-1, Los Angeles 27, Calif.

CANDIED Popcorn and Potato Chip Equipment. Eakins, Box 933-B7, Springfield, Ohio.

PROFITABLE Opportunities in Mail Order. Expert shows how. John Seery, North Conway, New Hampshire.

HOW to operate successful mail order, advertising and writing business. Free information. PS Thowe, 643 McLaughlin, San Antonio 11, Texas.

TO $100.00 weekly. Sparetime, home operated mailorder business. Successful "Beginner's" plan. Everything supplied. Lynn, 10420-C National, Los Angeles 34.

$320,000.00 MAIL orders lassoed from my Texas ranch. How I do it. Eveningshade, Boerne, Texas.

SHINE Shoes Without "Polish." New invention. Lightning seller. Shoes gleam like mirror. Samples sent on trial. Kristee 111, Akron, Ohio.

BECOME Tax Consultant. Graduates earn to $3,000 every tax season preparing returns evenings. State approved. Union Institute, Hoboken 1C, New Jersey.

FREE Folio "$5,000-$45,000; Unlimited Vacations." No merchandise, equipment. Unknown! Work home—sparetime! Haylings—S-16, Carlsbad, Calif.

EXTRA Income—work home. Free details. Sample $1.00. Handmade glass figurines. 18724-B Martha, Saratoga, California.

BUY at Wholesale Prices! Resell at Big Profits. Brand name merchandise—Appliances, cookware, housewares, watches, jewelry, rings, dry goods, clothing, luggage, tools, sporting goods, toys, gifts, etc. Free 1958 color catalog. Write today. Merit Home Products, Dept. PS-9, 107 Manhattan Ave., Brooklyn 6, New York.

CYPRESS Knees $5.00 Dozen, Up. Details. Gipple's Giftwares, DeLeon Springs, Florida.

OPERATE profitable mail-order business. National Specialties, 3755 Roslyn, Riverside, California.

NATURAL Molding Rubber; Extra Thick. Free Sample. W. Wooley, 1016-B Donald; Peoria, Illinois.

FREE Folder, "How To Make $3,000 Yearly Sparetime, Backyard, Raising Earthworms!" Oakhaven-42, Cedar Hill, Texas.

PROFITABLE—Tested Sparetime Mail-order Opportunity! Everything Supplied. Jackson, Newfoundland 2, Kentucky.

WANT To Make Big Money At Home? $10.00 profit in an hour possible with Invisible Mending. Make tears, holes, disappear from clothing, fabrics. Steady year-round demand from cleaners, laundries, homes. Details Free. Fabricon, 6244 Broadway, Chicago 40, Illinois.

MAIL Order Business For You? Professional Service Helps Find Answer. No Plans, No Schemes. Postcard For Information. Foster, Box 8382, Albuquerque, New Mexico.

OPERATE 100% profitable opportunity —$1.00. Everything furnished! Perez, 6 Bridle Lane, Hicksville, New York.

$250 WEEK cleaning venetian blinds. Patented Machinery. Free literature. Robinson, 7213A, Indianapolis 1, Indiana.

IMPORT your own products in small lots. Also start profitable mail order business using International Dropshipment method. Capital unnecessary. Free details. Ga. Overseas Trading Co., Dept. D 3, 715 Persons Bldg., Macon, Georgia.

VENDING Machines—No Selling. Operate A Route of Coin Machines And Earn Amazing Profits. 32-Page Catalog Free. Parkway Machine Corporation, Dept. 18, 715 Ensor Street, Baltimore 2, Maryland.

LIQUID Rubber. Make flexible molds. Free Sample. Chaney, 1907-C East Rd., Jacksonville 11, Fla.

LEARN Vacuum Cleaner—Sewing Machine Repairing. Big field. Gardner Repair, Box 21, Jenkintown, Pennsylvania.

MAILMAN brings $150 daily. Tested, authentic, amazing mail order opportunity. Details free. Holiday Publications, 2301 Greysolan Road, Duluth, Minnesota.

$10.00 PER Hour Net Profit in Monument Cleaning Business. Free Details. X-Pert Monument Cleaning Company, 466 Potomac PS-6, Buffalo 13, New York.

METALIZE Baby Shoes; Repair Dolls; Rebuild Batteries; Catalogue "75 Ideas" Free. Universal, Box 1076-B, Peoria, Illinois.

$250 WEEK reported! Free book "505 Odd, Successful Businesses." Work home! Expect something Odd! Pacific-36C, Oceanside, California.

"MAILORDER Laws and Regulations." $1.00. Explains necessary licenses, different taxes, legal requirements, etc. "Mail-order Rules for Beginners," $1.00 additional. Tasker, 1603 Peach Street, Alexandria, Virginia.

$30-$60 WEEKLY addressing envelopes. Instructions $1, refundable. Reiss, 210 Fifth Ave., Suite 1102-BE, New York 10.

BIG Money Raising Fishworms and Crickets. Free Literature. Carter Worm Company, Plains, Georgia.

CASH from Sawdust (seventy methods). Tin-cans (thirty methods). Newspapers (eighteen methods). Instructions 50c each. All three $1.00. Charles Company, 12-EXV, Norwood, Ohio.

PLASTERCRAFT molds, liquid rubber, plasters, flocks, candle supplies. Catalog and manual free. Jayhawk Plasters, Blue Rapids, Kansas.

FREE "Franchise Profit Letter" describes nationwide opportunities. Exclusive distributorships, dealerships, agency operations. Write today. National Franchise Reports, 333 North Michigan, Chicago 1.

SAVE Those Newspapers! They may contain information worth real money. Inquire: Publishers-P, Cedar Hill, Texas.

$50.00 BUYS sparetime "Package Deal" mailorder business. Complete details free. Tasker, 1603 Peach Street, Alexandria, Virginia.

OPPORTUNITY to earn $15,000-$30,000 annually. Franchise protected. Granted on $12,500 basis. Live at home. No merchandise to buy. Selfemployed. One of most exclusive and noncompetitive Businesses in United States and Canada. Send for free explanatory booklet. Harrell and Company, Box 8-D, Louisville, Illinois.

THEY Hand Him $100. Free Packet. "Secret Journal." 919 secrets—plans! Work home. Publico-E, Oceanside, Calif.

POPULAR SCIENCE OPPORTUNITIES

MAKE Attractive, durable, building plastic, easily. 800% profit. Exclusive district. Bays Laboratory, Cedaredge, Colorado.

MINK Raising information free. Complete. Lake Superior Mink Farm, Superior E E5, Wisconsin.

MAKE flexible molds. Cast plaques, figurines. Free sample. Tooker, 1045-A Fairview, Hamilton, Ohio.

OPERATE restaurant or diner. Free booklet reveals plan. Write Restaurant Arts, 49-BU, Fremont, Ohio.

UNUSUAL opportunity. Free Literature. Quill Industries, 3607-09 South Hamilton, Chicago 9, Illinois.

COLORGLAZED Concrete pottery made without molds. Patented method. Cemetery products, novelties, tiles. Basement leak-sealing Money-making projects. Booklet, details free. Men only. National Potteries, Grand Rapids, "Minnesota."

$60.00 WEEKLY sparetime. Start home Venetian Blind Laundry. Protected Territory. Interesting information free. Burtt, 2434ET, Wichita 13, Kansas.

BE your own boss. Learn how to start making $$$$ spare time using U.S. Government approved methods. $1.00 sent to Ace, Box 155-B, Danville, Calif., can start a carefree future for yourself and family.

BUY Direct From Factories—Appliances, Cameras, Watches! Free details! Cam Company, 6810PS-20th Ave., Brooklyn 4, New York.

IMPORT — Export. Modern dropship method. Details free. The Hazen Company, 6601A-8th Ave. N., St. Petersburg 2, Florida.

BIG Money Opportunities. Free Details. Sales Ideas, 1327 N. Orange Drive, Hollywood 28, California.

LIQUID Marble—Brushed! Sprayed! Mold novelties, tile! Particulars free. Marbelizing Service, Edwardsville, Illinois.

OPPORTUNITY Knocks! Free Details. Castle's Homestudy School of Dancing, 158 Smith, Brooklyn 1.

AMAZING Earnings. Operating Home Sharpening Service. Especially designed equipment. George Page, 1820 Cleveland, Niagara Falls 4, New York.

OPERATE easy-to-start, profitable home Mailorder Business! C. Mann, Woodcliff Lake, N. J.

RECEIVE opportunity mails, get listed 25¢ year. Craft Lists, 2694 S. 10, Fresno 25, California.

"EVERYBODY Likes Candy." Make professionally home. (Our 45th Year.) Ragsdale Candies, East Orange, N. J.

UNUSUAL. "137 Successful Home Business Methods". Service, Box 636PS, Newport News, Virginia.

WE Pay $3.50 lb. dried. Grow Mushrooms. Cellar, shed and outdoors. Spare, full time, year round. We have 25,000 customers. Free Book. Washington Mushroom Ind., Dept. 178, 2954 Admiral Way, Seattle, Wash.

$26,500 BY Mail Order in Two Weeks!! Amazing Radio-Mail Order method using powerful stations. Start fabulous business on low capital. Products sources supplied. Free details. Broadcast Service, 1412-DI Great Northern Building, Chicago 4.

MAKE $46 From Square Foot Plywood; Jigsaw necessary. Free Details. Woodarts, Bridgewater, Mass.

MAKE Big Profits clipping newspaper items for publishers. Instructions explain how. Particulars free. National, 81-N, Knickerbocker Station, New York.

CRICKETS, Hula-hula wigglers. 35¢ booklet tells all. Kean, Ladonia, Texas.

"POST Card Profits" unmatched Mail Order Plan. 50¢. Craft, 2694 S. 10th, Fresno 25, California.

MAKE New Greaseless Doughnuts In Kitchen. Sell stores. Free recipes. S. Ray, 3605 South 15th, Minneapolis 7, Minnesota.

MAKE Money Mailing Catalogs. Big profits. Sample. Details. 35c. Crowe, 1725 Wymore, East Cleveland 12, Ohio.

SENSATIONAL Item. Mail agency business. Make 300 per hour. Kitchen table. Angora House, 1058-3, Springfield, Illinois.

FREE "How to Start Your Own Mail Order Business." Exclusive franchise! Your own catalogs. We ship hundreds of top mail order items for you. Write now! Mail Order Associates, Rochelle Park 24, New Jersey.

IF you have a product or service that can be operated on a mail order basis, write me today. I will send you a Free Kit on "How To Make Money Out Of Classified Advertising". Next issue will be November. Closing date September 24th. Hurry—Do it Today! O. K. Kelly, Classified Adv., Mgr., Dept. 97, 353 Fourth Avenue, New York 10, N. Y.

38 MONEYMAKING OPPORTUNITIES

SELL Titania Gems; far more brilliant than diamonds. Catalog 10c. Diamonite, 2420-S 77th, Oakland 5, California.

MEN and women wanted to start home business in spare time with little table-top rubber stamp machine. Easy to earn up to $9.80 an hour without previous experience. Full particulars. Free by mail. Send postcard to Roberts, 1512 Jarvis, Room CR-3-S, Chicago 26, Illinois.

BUY Wholesale! 30-80% Discounts! Appliances, Gifts, Typewriters, Tools, Watches, Sporting Goods, Jewelry, Cameras, Housewares, etc. Consolidated Distributors, Clifton 11, New Jersey.

"50 NEW Home-Business ideas" booklet Free. Coast Industries A9C, Los Angeles 61.

MEN—Women! Start Money-Making Plastic Laminating Business at home in spare time. Material that costs 11c brings back $2.58. No canvassing or selling but mail orders bring in $20 a day. Write for full particulars Free. Rush name on postcard to Warner, Room CL-3-S, 1512 Jarvis, Chicago 26, Illinois.

HOMEWORKERS! Write for exciting details concerning Addressing and Mailing. Temple Co., Muncie 7, Indiana.

START Big-Pay business at home in spare time. No experience needed to operate little table-top machine for bronzing baby shoes. Make $5.46 profit on every pair. Full particulars free. Send postcard to Mason, 1512 Jarvis, Room CM-3-J, Chicago 26, Illinois.

MAKE Big Easy Profits making costume jewelry at home in spare time! Quick easy to make; easier to sell! Details Free! Don-Bar, 3511 W. Armitage, Dept. J-202, Chicago 47, Illinois.

$100.00 WEEKLY Spare Time With A Tape Recorder! Fabulous new business. Entire country wide open! Record weddings, parties, sports events, stereophonic sound, sound-on-sound multiple recordings. Make radio commercials, sound effects. Have fun and make big money in the glamorous business of Tape Recording. Moneymaking Facts Free! Dixieland Publishers, Asheboro 8, North Carolina.

FREE Literature, big money mailorder opportunity. Laircraft, Box G-5008, Detroit 35, Michigan.

FART Time Earnings of Over $50.00 Weekly as Trained Bar-Man. Home Bar Owners! Be Experts For Your Friends. Professional Instruction Plus Internationally Famous Recipes, $1.00. Bartender, 567 Fairway Ter., Phila. 28, Pennsylvania.

YOUR Own Business—Learn what method will turn your $9.60 into $94.00 or $20.00 into $240.00. Information Free Pittman's Industries, Box 992-S, Porterville, California.

FREE Folio "$5,000-$45,000; Unlimited Vacations." No merchandise. Unknown! Work home—sparetime! Haylings—S16, Carlsbad, Calif.

OVER 1500 Men, Women, Children in one state make money at Home. Free details. Mail-Towne, P-9 Murray St., New York 7, New York.

$1,000.00 MONTHLY for 26 years! Stay home and enjoy life with the most fascinating mailorder business ever conceived. The postman has put over $250,000.00 into one mailbox with this Plan! Learn how you too can start right now. Facts Free! Dixieland Publishers, Asheboro 62, North Carolina.

VENDING Machines—No Selling. Operate A Route of Coin Machines And Earn Amazing Profits. 32-Page Catalog Free. Parkway Machine Corporation, Dept. 19, 715 Ensor Street, Baltimore 2, Maryland.

DETECTIVES—Work home—Travel. Experience unnecessary. Detective Particulars free. Write, Wagoner, P-125 West 86th, New York 24.

FIVE years ago I had no job and little money. Today I am retired, own a home, car, and bank account. Anyone can do this regardless of age or education. One dollar brings story. Information free. N. Cole, 217 49th Street West, Bradenton, Florida.

CLIPPING Wanted Items Your Local Newspaper brings dollars!! Cutler Enterprises, Reading, Pennsylvania.

NEED Extra Money? Earn Easy Home Profits. Rush $1.00. Kidd, 107 Broadway, Clark, New Jersey.

PROGRESS for you who are interested in mail order business. Whether a beginner or experienced. Succeed with your ideas and our guidance. Let us prove it. Write The Progress Company, 620 West Anaheim Street, Long Beach 13, California. Established 1941.

FOOD Supplements Booming! Sell Super-potent "Supervite." Vitamin Specialty, 5522½ Hollywood, Los Angeles 28.

FREE! Profit-Making "Newsletter" for Mail Order Enterprisers. Ramco, Box 25, Alhambra, California.

PLASTICS. Toys and Novelties Buy direct (Wholesale Catalog $1.00 refunded with your first order). National Industries, 113 Hamilton Street, Dorchester, Massachusetts.

SELL Merchandise By Mail Using Four Color Catalogs! Fifty Fast Selling Items! Orders Filled For You! Sample, Plans Free! NMMA, 618 Washington, Boston 24-B, Massachusetts.

$30-$60 WEEKLY sparetime, addressing envelopes at home. Instruction manual $1, refundable. Reiss, 210 Fifth Ave., Suite 1102-S, New York 10.

AMAZING successes through franchises! Become exclusive franchise holder your territory. Information rushed. National Franchise Reports, 333 North Michigan, Chicago 1.

FREE Book "505 Odd Successful Businesses." Work Home! Pacific-35c, Oceanside, Calif.

EARN Extra Cash Address Advertising Postcards. Box 586, Glendale, California.

BIG Money raising fishworms and crickets. Free Information. Carter Farm-11, Plains, Georgia.

$100.00 WEEKLY spare room. Raise redworms soilless way. Odorless. Charlie Morgan, Box 116C, Bushnell, Florida.

MEN Easy way to make extra money collecting and selling scrap. Full or spare time. Get the facts. Informative booklet free. Write, Scrap System, Dept. =10, 971 North McDuff, Jacksonville, Florida.

SPARETIME Repeat Profits Taking Magazine Subscriptions, Special Offers. Cassell Agency, Boynton Beach 7, Florida.

POPULAR SCIENCE OPPORTUNITIES

$1200.00 MONTHLY Proved! Rid homes, farms, businesses of termites, rodents, pests. New shortcut methods! Learn everything two weeks! Free success plan. A.P.C.A.O., Dept. 2A, 429 South Western, Los Angeles 5, California.

BIG Offer and Opportunity Mail 10c. Palm Mailers, Box 1221, Baton Rouge 7, La.

EARN $15,000 yearly at home on $5 and 3 hours a week. No experience necessary. Proof, details, complete plan only $1. Satisfaction or refund. Columbia Enterprises, 8203A Grubb Road, Silver Spring, Maryland.

$60.00 WEEKLY sparetime. Start home Venetian Blind Laundry. Protected Territory. Interesting information free. Burtt, 2434EU, Wichita 13, Kansas.

MAKE Money Clipping Articles From Your Newspapers! Complete plan. Newscraft, PS-983-E, Main, Columbus 5, Ohio.

HOTTEST Mail Order Plan Ever! Sell photos, films, art novelties. Huge proven profits! Free Details! A.M.P.R.O., Dept. 2A, 429 South Western, Los Angeles 5, California.

THEY Hand him $100. Free Packet. "Secret Journal," $19 secrets—plans! Work home. Publico-E, Oceanside, Calif.

RUSH $1.00 for informative data. Sensational Promotional Plan. Nets $2000.00 in month. Nu-way Merchants Advertisers, P.O. Box 281, Massapequa, New York.

BUY Wholesale! Save 66 2/3%! 100,000 Name Brand Appliances, Housewares, Clothing, Furniture, Tools, Sporting Goods.—Everything! Free Catalogs, Illustrations! National Buyers Service, Box 3338FB, San Francisco.

DOLLARS Every Day! Amazing Magic Mailorder Plan. Setup Free. Miller, Box 588-A, Oshkosh, Wisconsin.

NOW'S time for profitable Weatherstripping.—E-Z-On—35, 1009 Harvard, Evanston, Illinois.

WOOD Fibre Flower Materials, Xmas supplies, others. Catalog 25¢. Flower pattern book—$1.10. Latest Style Xmas corsages 35¢. Flowers expertly made—wholesale. Lora, 715 Lorain, Dayton 10, Ohio.

MAKE Big Profits clipping newspaper items for publishers. Instructions explain how. Particulars free. National $1-N, Knickerbocker Station, New York.

NATIONALLY Known Bureaus need part-time Correspondents Now! Up to $100.00 monthly possible. Instructions & Bureau addresses $1.00 (Refundable). Post Service Bureau, Box 16, Rice Lake, Wisconsin.

SPARETIME, Big Profits, selling New wonder polish for all metals. Free information. G. J. Senan, 21913 Lakeland, St. Clair Shores, Michigan.

MAKE Double Profits selling Whitehall's New Photo Statuettes and Greeting Cards. Life-like miniature Statues of children, friends, pets, sell on sight. Extra Cash with exclusive Personalized Christmas Cards, Stationery, Napkins, Gifts. Free Sample Portfolios. Write Whitehall Studios, 997 Cleveland Avenue, Elmira, New York.

WE Pay $3.50 lb. dried. Grow Mushrooms. Cellar, shed and outdoors. Spare, full time, year round. We have 25,000 customers. Free Book. Washington Mushroom Ind., Dept. 179, 2954 Admiral Way, Seattle, Wash.

UNUSUAL, honest moneymaking opportunity. Details 20c. Valjean, Box 797, Yakima, Washington.

LEARN high paying newspaper trade at home. Write to Thomas Smith, P.O. Box S-3987, Sarasota, Florida.

OFFICE Men. Good money year after year, preparing Income Tax Returns spare time at home. No lessons. Only fourteen hours study evenings. Amazingly simplified. Write. Reynard, Box 1265-C, Peoria, Illinois.

IF you have a product or service that can be operated on a mail order basis, write me today. I will send you a Free Kit on "How To Make Money Out Of Classified Advertising". Next issue will be November. Closing date September 24th. Hurry—Do it Today! O. K. Kelly, Classified Adv., Mgr., Dept. 97, 353 Fourth Avenue, New York 10, N. Y.

38A BUY IT WHOLESALE

BUY Wholesale! Over 10,000 Nationally Advertised Products. Appliances, Cameras, Sporting Goods, Housewares, Watches, Typewriters, Tools, Clothing, etc. Send Postcard Today. Buy-Rite, Box 258, Hawthorne 8, New Jersey.

SAVE to 80%, 800,000 items. Clothing, groceries, fuel, car costs. Free details. Holiday Publications, 2301 Greysolan Road, Duluth, Minnesota.

BIG Multicolor Wholesale Catalog! Housewares, appliances, clothing, silverware, cookware, luggage, binoculars, radios, phonographs, cameras, recorders, projectors, typewriters, shavers, sporting goods, toys, tools, sewing machines, watches, jewelry. Name brands. Huge discounts. Postcard: Selbyco, Decatur 172, Illinois.

124-PAGE Wholesale Catalog! Discounts to 80%! BTS Products, Oakland 217-20, New Jersey.

ELECTRIC Guitars, amplifiers, wholesale. Free catalog. Carvin, PSW, Covina, California.

WHOLESALE Catalog! Discounts to 80%! Clothing, Appliances, Tools, Watches, Housewares, etc. Midwest, PM-156, Pontiac, Illinois.

39 FORMULAS, PLANS, ETC.

FORMULAS—All kinds. Latest products. Literature free. Kemico, Park Ridge 18, Ill.

15 SELECTED formulas $1.00. Proco, 1456 Walnut St., So. Plainfield, New Jersey.

FREE Formula Catalog. Anything analyzed reasonable. Western Chemical, Salem, Oregon.

LATE Modern Manufacturing Formulas List Free. Chemical Service, Martville, New York.

MODERN Formulas for the best in fast selling, big profit products. Eye-opening literature free! Miller, Chemist, 1517-S, Tampa, Florida.

40 PLASTICS

LEARN Plastics Fabrication For spare time income. Low cost home training now available. Write for free booklet. Interstate Training Service, Dept. D-2, Portland 13, Oregon.

NEW Liquid Casting Plastic, clear, colors. Embed real flowers, coins, photos. New Manual shows fine things you can make at home and sell at big profit. Send 25c. Castolite, Dept. K-102, Woodstock, Illinois.

PLASTIC Supplies: Catalog Includes Course In Laminating, Casting, Embedding, Formulas, Manufacturing Methods For Hundreds Of Profitable Items. Liquid Steel, Glass, Rubber. Send 25c. Gel, Box 261, Union, New Jersey.

LAMINATORS 'job' out your larger work. 10x12 only 65c. Write Lieco, Box 66, College Point, N. Y., for price list.

PLEXIGLAS, Square foot cost, 1/16"—$1.20; 1/8"—$1.52; 3/16"—$1.86; 1/4"—$2.21; 3/8"—$3.23; 1/2"—$4.36. Colors add 10%. Send 15% for postage. Aristocrat Plastics, 23-25 Sussex Ave., Newark, New Jersey.

PLEXIGLAS — Any thickness — Clear —Colors—Cut to size—Clear Rods—Tubing. McClarin Plastics, P.O. Box 168B, Hanover, Pennsylvania.

41 CHEMISTRY & PHYSICS

ATOMOTRON, model atom smasher, $14.95. 3-in-1 Electromagnet; $14.95. Cloud Chamber, $32.50; Plans, $1. Send 25c for literature. AtomLab, Box 343, Berkeley, California.

CHEMICALS, Supplies. Catalog 25c. Laboratory Sales, Box 161-B, Brighton, Massachusetts.

BIOCHEMICALS: Hormones, Nucleo-Proteins, Amino acids, Vitamins, Chick Embryo extract and Gibberellins. Literature 10c. Sample Gibberellic acid 50c. Royal Scientists of America, RD #4, Towanda, Pennsylvania.

CHEMICALS and apparatus for industrial, analytical and private laboratories. Catalog 25c. Dept. M-26, Biological Supply Co., 1176 Mt. Hope Ave., Rochester 20, N.Y.

ILLUSTRATED Catalog: Chemistry, mineralogy, biology 20c. Tracey Laboratories, Evanston, Illinois.

60 PAGE Booklets! "Beginners Chemistry," "Chemistry," "Physics," "Relativity," "Light," "Astronomy," "Electricity," "Radio," "Useful Tables," "Scientific Oddities." 10c Each. Franks, 3121 South Racine, Chicago 8.

EXPERIMENTERS: Terrific Bargains! Catalog 25c. Hagenow Laboratories, 2414 Clarks, Manitowoc, Wisconsin.

AMAZING New Book of Science. Experiments, Formulas, and Catalog of Laboratory supplies. Only 25c. National Scientific Co., Dept. PS-9, 500 West Road, Lombard, Illinois.

HOME laboratory and apparatus kits. Laboratory supplies. Catalog 25c. Established 1931. John H. Winn, 124B West 23rd Street, New York, N. Y.

42 HELP WANTED

WANTED: Experienced Chevrolet mechanic to work in long established Chevrolet dealership. Ernest Allen Motor Company, 615 Commerce Street, Fort Worth, Texas.

EARN High Pay: Jobs in South America, the Islands, USA, Europe, Canada, other foreign countries. All Trades, Mechanics, Truck Drivers, Laborers, Office Workers, Engineers, etc. Chance to travel. Fare paid if hired. Application forms. Free information. Write Dept. 110, National Employment Information, 1020 Broad, Newark, New Jersey.

MILWAUKEE! Job Opportunities. Latest Complete Want Ad Columns $1.00. De Munck, 5064 North Kent, Milwaukee, Wisconsin.

COPYRIGHTED Reports on best paying jobs with travel, adventure, promotions. Construction, aviation, shipping, laborers, clerical, trades, supervisory, factory, unusual opportunities. Many types of work. Skilled and unskilled. Foreign and stateside openings for men and women. Only $2.00 ($2.25 airmail) including registration-advisory service. Satisfaction guaranteed. Included absolutely free: Special reports on Alaska, Spanish airbase construction, South American opportunities and husband-wife foreign jobs. Research Services, Suite 514-PSQ, Meramec Building, St. Louis 5, Missouri.

AMERICAN, Overseas Jobs, High Pay, Men, Women, transportation paid. Free Information. Transworld, 200J West 34 Street, New York 1.

FOREIGN-USA—Guaranteed Jobs To $20,000. Men and Women (All Fields), Truck Drivers, Etc. $2.00 ($2.25 air mail). Vocations, Box 786, Norwalk, Connecticut.

FOREIGN, Alaskan, USA jobs!! To $1500 Monthly! Million Americans, Employed Overseas. Copyrighted Reports. Who to contact for highest paying jobs. Laborers—Trades—Truck Drivers—Office—Engineers—Many Others. 52 Countries—St. Lawrence Project, Spain, Latin America, Northern Projects, Europe. Year Registration—Advisory Sarasota. Application forms. Unconditional Money-back guarantee! $2.00 (Airmailed $2.25) (COD's Accepted). International Reporter, St. Louis 1-SX, Missouri.

POPULAR SCIENCE OPPORTUNITIES

FLORIDA'S Booming! Hundreds of Jobs. Special Statewide Analysis Airmailed $2.00. Sun-Glo Service Bureau, Perry 12, Florida.

JAPAN. Many hi-paying jobs available. Full and complete details. $1.00. Waits, Box 903, C.P.O., Tokyo, Japan.

BOOMING Venezuela—Only hours from the States. New data regarding Jobs, Opportunities, Conditions, etc. Salaries to $1650 monthly US tax exempt. Bonuses. Living Allowances extra. First-hand info direct $2.00 ($2.35 Air Mailed). Checks or Money Orders only. Paul B. Smith, Apartado 172, Maracaibo, LaSalina, Venezuela.

FOREIGN and domestic jobs. Are you bored with your present job, need a change, eager for adventure, more money. Why not check on overseas opportunities. Guaranteed salary, overtime, bonus, transportation paid. Cooks, First aid men, deckhands, guards, clerks, mechanics, helpers and others wanted for Mid-Pacific Mechanics, pipefitters and others wanted for Saudi Arabia. Men for the oil fields of Venezuela. Highway maintenance workers for Near East. For full information on these jobs and many others with sample application blank, mail $1.00, airmail $1.25, today to Overseas, Box 486, Dept. 101, Reseda, California.

FLORIDA Job Directory over 350 leading firms. $1.00. Florida Employment Journal, 66 Treasury St., St. Augustine, Florida.

COMING To California?—Choice listings of jobs, housing, business opportunities, etc. 15 Page Booklet + Free Gift $1.00. Chesley's, 3977½ Texas Street, San Diego 4, California.

43 AGENTS WANTED

YOUR own business—Suits $1.50; Overcoats 65c; Mackinaws 35c; Shoes 12½c; Ladies' Coats 30c; Dresses 15c; Enormous profits. Catalog Free. Nathan Portnoy Associates, 606-J West 12th Place, Chicago 7.

AGENTS—300% profit selling genuine gold window letters; stores and offices. Free samples. Metallic Sign Letter Co., 1217-E West Newport, Chicago.

START Your Own Business On Credit. Your own boss. 1527 Dealers sold $5,000 to $32,000 in 1956. We supply stocks, equipment on credit. 200 home necessities. Sales experience unnecessary. Pleasant profitable business backed by world-wide industry. Write Rawleigh's, Dept. I-U-PSC, Freeport, Illinois.

GOLD or Silver letters, numbers. Windows, Doors, Trucks 1" to 6". 500% Profits—Free Samples. Atlas-U, 544 West 79th, Chicago 20.

NEW Jobs open in selling! Send name, address for five free issues of Opportunity Magazine's money-making guide, listing hundreds of companies who'll pay you well, full or part-time. No experience needed. Opportunity, 850 N. Dearborn, Dept. 18, Chicago, Illinois.

GOLDMINE Of 600 money-makers. Copy Free. Specialty Salesman Magazine, Desk 6-B, 307 N. Michigan, Chicago 1.

EXCLUSIVE line of personal initialed buckles, belts, cap badges, 3,000 emblems, uniforms, shirts, caps, etc. Hook-Fast, Dept. PS, Roanoke, Virginia.

IF You Want to earn money fast, I'll send you Free Sample Stocking Of newest Stretch DuPont Nylons to sell at only $1.00 a pair. American Mills, Dept. 624, Indianapolis 7, Indiana.

MAKE Good Money In Spare Time without taking a job or putting in regular hours and without experience. $50 to $200 can be yours by showing Regal Christmas Cards to friends, neighbors, co-workers. So unusually beautiful they sell on sight. Write for Free Christmas card album and sample boxes on approval. Regal Greetings, Dept. 71, Ferndale, Michigan.

EVERY man a prospect. Request free sales kit showing line of belt buckles, individualized with customer's name and emblems also cap badges for trucking, bus, taxi, police, firemen. Choice 3000 emblems. Hook-Fast, Box 1425PS, Providence, Rhode Island.

NEED Money? $50 yours. Sell only 100 boxes new Christmas cards. Other amazing offers. Free samples imprinted cards. Feature box assortments on approval. Free catalog. 100 profitable items. Work with a national leader. Write today. Pen-N-Brush, Dept. PS-9, 139 Duane Street, New York City 13.

$1,000.00 A month for making dramatic 3-second demonstration of amazing lightweight Presto Fire Extinguisher. New chemical used by airforce snuffs out fires instantly. Only $4.95. Terrific commissions. Millions want it. Free Kit. Merlite, 114 E. 32nd, Dept. P-58A, New York 16.

60% PROFIT On Cosmetics—Famous nationally advertised Hollywood Cosmetics pay 60%! Make $25-day up! Hire others. For free samples, details, write Studio Girl, Glendale, California, Dept. 1179G.

MAKE money quick, easy, taking subscriptions from every family in your community. Liberal commissions. We tell you how, furnish all supplies Free. Write McGregor Magazine Agency, Dept. 120, Mount Morris, Illinois.

CHRISTMAS Cards—impressive albums of Deluxe and Popular-Priced greetings with customer's name imprinted. 150 lavish designs for Business and Personal use. Wide selection for every taste and budget. You can earn $300 to $500 commissions—even in spare time—between now and Christmas. Sales experience unnecessary. We furnish free fully equipped sales kit complete with albums and easy-to-follow selling instructions. Dependable service guaranteed by old established manufacturer. Write Process Corp., 1952 S. Troy, Dept. PE, Chicago 23, Illinois.

TREMENDOUS profits! Every man, woman and child a customer. Suits $1.50. Pants 35c, Dresses 20c, Shoes 20c. Operate from store, home, car. Free catalog. Superior, 1250-B Jefferson, Chicago 7.

MONEY-Making Opportunity! Take big profit orders for world famous Patented Varieties Fruit Trees. Also Flowering Shrubs, Roses, Vines. Big Sales outfit Free. Stark Bro's, Desk 30198, Louisiana, Missouri.

NEW Christmas Card Discount Selling Plan pays you more! Make $100 cash easy in spare time. 250 finest Gift and Card sellers. Many Exclusive! Personals Album Free, other samples on approval. $1.25 Gift Free for promptness. Cardinal, 1400 State, Dept. 80-D, Cincinnati 14.

DRYCLEANS Clothing for only 10c per garment. Lightning seller. Saves drycleaning bills. Samples sent on trial. Kristee 68, Akron, Ohio.

BEAUTIFUL Feather Pictures. 200% Profit! Free Details; Sample 20c Stamps. Sylvial, Apartado 9036, Mexico City.

GET New Shirt Outfit Free: make $90.00 weekly on 5 average orders a day. Famous quality Made-To-Measure dress and sport shirts at $3.95 up sell fast to all men. No experience needed. Full or part time. Write: Packard Shirt Co., Dept. 521, Terre Haute, Indiana.

SEEKING New Products? Get my outfit 47 money-making specialties. Latest conveniences for home, car. Send no money. Just your name. Kristee 69, Akron, Ohio.

EARN $200.00 A Week In Your Own Business! Details Free! Jones, BPS1, 164 Sumpter Street, Brooklyn 33, New York.

MAKE $50—$75—$100 again and again. Show friends New Idea Christmas. All Occasion boxed assortments, gift wrappings. Profits to $1.00 per box. Write for Feature boxes on approval. 64 Free Personal Christmas Card, Stationery samples. Free Catalog. Sensational Free Offer. New England Art Publishers, North Abington M-97, Massachusetts.

ELGIN, Waltham, reconditioned wrist watches, guaranteed like new, $6.95; ladies' $7.95. Joseph Bros., 5-A South Wabash, Chicago 3.

DOOR Cushion New Item $.25 Seller. Send $.10 For Sample. Eng. Enterprises, P.O. One, Elmhurst, Illinois.

WHOLESALE catalog. Clothing, linens, housewares. Write Bostonian Distributors, 14-A Dock Sq., Boston 8, Massachusetts.

EASY handwork makes fast-selling articles. Sample free. Sunmade Company, Brockton 64, Massachusetts.

BUSINESS of your own. Earning potential as high as $40,000 annually. Issued on $12,500 base. No merchandise to buy. Send for free explanatory booklet. Harrell & Company, Box 8-DD, Louisville, Ill.

ANYONE can sell famous Hoover Uniforms for beauty shops, waitresses, nurses, doctors, others. All popular miracle fabrics—nylon, dacron, orlon. Exclusive styles, top quality. Big cash income now, real future. Equipment free. Hoover, Dept. J-101, New York 11, N. Y.

WHERE To Buy thousands nationally advertised products at rock-bottom wholesale prices. Rush name, address for Free "Wholesale Plan." Glass, Ellwood City 2, Pa.

CHRISTMAS Music Cards. Dorby Music Cards, Box 354, Morristown, New Jersey.

SCHOOL Seniors. Be Popular With Classmates. Have Spending Money Galore. Details Free. Craftcards, Box 235-M, Pittsburgh 19, Penna.

REAL Diamond Rings. Nationally advertised. Sell direct. Make big middleman's profit. No investment. Experience unnecessary. Free catalog, details. Gleamlight, 108D North Columbus, Mount Vernon, New York.

IF you have a product or service that can be operated on a mail order basis, write me today. I will send you a Free Kit on "How To Make Money Out Of Classified Advertising". Next issue will be November. Closing date September 24th. Hurry—Do it Today! O. K. Kelly, Classified Adv., Mgr., Dept. 97, 353 Fourth Avenue, New York 10, N. Y.

44 HIGH-GRADE SALESMEN

MAKE Extra Money. Cash commissions. Everybody buys easy-to-sell Advertising Book Matches. Union Label. Big variety—Glamour Girls, Scenics, Hillbillies. Powerhouse selling kit. Free. Steady repeat business. No experience necessary. Superior Match Company, Dept. P-957, 7528 S. Greenwood, Chicago 19.

$1,000.00 A month for making dramatic 3-second demonstration of amazing lightweight Presto Fire Extinguisher. New chemical used by airforce snuffs out fires instantly. Only $4.95. Terrific commissions. Millions want it. Free Kit. Merlite, 114 E. 32nd, Dept. P-58A, New York 16.

AD Matches! Sell amazing designs—10, 20, 30, 40, and 240-light book matches. Bigger spot cash commissions; every business a prospect. Low prices for high quality. Repeats. Start without experience; men, women; full, part-time. Buy nothing. Sales kit furnished. Match Corp., Dept. PS-89, Chicago 32, Illinois.

BIG Moneymaking Opportunity. Exclusive line uniforms, jackets, pants, shirts, coveralls, sportwear. Advertising embroidered. Every business prospect. Get Selling Outfit Free! Master Co., Dept. D-11, Ligonier, Indiana.

44A ATOMIC ENERGY

STUDY nuclear reactor technology at home. Atomic Energy Institute, Signal Mtn. 12, Tennessee.

45 EDUCATIONAL & INSTRUCTION

USED Correspondence Courses and Books sold and rented. Money back guarantee. Catalog free. (Courses Bought.) Lee Mountain, Pisgah, Alabama.

POPULAR SCIENCE OPPORTUNITIES

BE a Real Estate Broker. Study at Home. Write for Free book today. GI approved. Weaver School of Real Estate, 2018R Grand, Kansas City, Mo.

COMPLETE Your High School at home in spare time with 60-year-old school. Texts furnished. No classes. Diploma. Information booklet free. American School, Dept. X646, Drexel at 58th, Chicago 37, Illinois.

STUDY For Doctor's degree of Psychology, Metaphysics and Divinity. Correspondence courses only. College of Divine Metaphysics, Dept P-S, 2811 North Illinois, Indianapolis 8, Ind.

EARN While You Learn Auto And Diesel Mechanics. Master this top paying trade. Many graduates earn $100 a week and up. Approved for Korean veterans. For free information write Dept. No. 262, Nashville Auto-Diesel College, Nashville 3, Tenn.

HIGH School diploma at home. Licensed teachers. Approved materials. Southern States Academy, Box 144 PX, Station E, Atlanta, Georgia.

WANT A Diesel Job? New Opportunities to increase income. Higher Pay, More Money. We can help you Qualify. Tools Shop method home training. Write today! Diesel, Tractor, Heavy Equipment Division. Interstate Training Service, Dept. B-2, Portland 13, Oregon.

QUALIFY for college equivalence degrees by examination. No courses. Increase opportunities for promotion, better pay. Approved by employers and educators. Cramwell Research Institute, Adams 7, Mass.

PIANO Tuning pays. Big money in spare time. Learn at home in 30 days. No musical knowledge necessary. Phonograph, records, tools and instructions furnished. Personal instructions available. Free catalog. Capital Tuning School, 18 Southwest Second, Fort Lauderdale, Florida.

LEARN Appliance Service and Repair. Motors, Washers, Refrigeration, Cleaners, everything. Free Booklet. Armstrong, 11027-B South Vermont, Los Angeles 44.

DRAFTING, Design, Blueprint Reading. Good paying. Easy to learn at home. Minimum age 17. Write Utilities Engineering Institute, Dept. TM-3, 2525 Sheffield, Chicago 14.

DRAFTING—building or mechanical. Learn at home in spare time, at low cost, from 60-year-old school. Information free. Write American School, Dept. D646, Drexel at 58th, Chicago 37, Illinois.

$1,000 MONTHLY possible in collection agency business. Free details. Write Cole Associates, Syracuse 2-A, New York.

REFRIGERATION, Air Conditioning. Extension course. Free booklet. Mechanics School, 11029-SR South Vermont, Los Angeles 44.

HELP yourself to abundant living. Our courses have aided students to richer, fuller lives. Learn secret of contentment, happiness. Earn degrees Ps.D. MsD. Write for free book. College of Universal Truth (Correspondence School), 23-K E. Jackson, Chicago.

HIGH School — No Classes. Study at home. Spare Time. Diploma awarded. Write for Free Catalog HBA-70, Wayne School, 2527 Sheffield, Chicago 14, Illinois.

IT'S Easy learning a language by Linguaphone's World Standard Conversational Method. At home, quickly, easily learn to speak French, Spanish, German, Japanese, Modern Greek—any of 34 languages. It's like living in another country. Save time, work, money. Send for free book. Linguaphone Institute, 54-097 Radio City, New York 20.

U.S. Civil Service Test! Training until appointed. Men—Women, 18-55. Start high as $340.00 month. Experience often unnecessary. Get Free 36-page book showing jobs, salaries, requirements, sample tests, benefits. Write today. Franklin Institute, Dept. L-22, Rochester, New York.

ENGINEERING Degrees earned through Home Study. Pacific International University, 5719-A Santa Monica Boulevard, Hollywood 38, California.

EASILY Make $65 Week as Practical Nurse. Learn quickly at home. No high school necessary, no age limit. Write today for free booklet, lessons. Post Graduate Hospital School of Nursing, 37E97 Auditorium Bldg., Chicago, Illinois.

END Time Bible Revealed. Send $2. Rev. 22 Kowall Pl., Lynbrook, New York.

EARN College Degrees. Correspondence. Metropolitan University, Box 86, Glendale, California.

EXTRA income—Raise fishworms. Instructions 35c. Free literature. Shady Oaks, 18724-BI Martha, Saratoga, California.

LEARN locksmithing from licensed experts at home in spare time. High pay. Free booklet. Locksmithing, Rutherford 102, New Jersey.

CAN'T Dance? Free Lesson Proves You Can! Castle's Homestudy School, 158 Smith St., Brooklyn 1.

WELDERS earn big money. Easy to learn Arc—Gas—Automatic Welding. New equipment, low cost training in non-profit school. GI Approved. Free Booklet. Hobart Welding School, Box P-971, Troy, Ohio.

BOOKLETS—$1.00. How to sell by mail order. 1957 Business Cycle Advertising Chart. Economist 343 Fairfield Avenue, Bridgeport, Connecticut.

MEN! Women! $$$$! Secrets! Career! Amazing Science Of Truth! Grapho Handwriting Analysis. (PS34) Sandy Hook, Connecticut.

LEARN While Asleep! Details Free. Research Association, Box 610-K, Omaha.

YOU For president of collection agency. We have helped hundreds get their names on office doors. Franklin Credit, Roanoke, Virginia.

A Dynamic Singing and Speaking Voice can be yours! Self-Training records. Thrilling details! Canfield, 2018-C Fifth Avenue South, Minneapolis 4, Minnesota.

BOOKKEEPERS! Comfortable Living For Life! Operate Your Own Simplified Business Analysis, Bookkeeping, Tax Service. Full or Spare Time. Details Free. Vanderdrift, 35B Franklin, East Orange, New Jersey.

MATHEMATICS. All levels. Correspondence. UCSM, 2406 W. Garfield, Milwaukee, Wisconsin.

BOOKKEEPERS! Increase your earnings! Operate your own simplified "Dollar-A-Week" Bookkeeping and Tax Service. Full or spare time. Details Free. No obligation. Ellis, Box 203, Cedar Grove, North Carolina.

"HYPNOSIS Unawares." Influence others while they sleep! Complete instructions by Ph.D.—$5.00. Satisfaction guaranteed. Wade Hampton, 1320 Micheltorena, Los Angeles 26, California.

EARN Degree. Free bulletin. Homestudy only. Midwestern Bible School, 1060 Broadripple, Indianapolis.

USED Correspondence courses. Submit your needs for quotations. (Courses bought.) Wall, Box 141, Byars, Oklahoma.

LEARN Real Estate—Study at home. Send for free catalogue. Midwest School of Real Estate, 68 North Chicago Street, Joliet, Illinois.

WE Pay $3.50 lb. dried. Grow Mushrooms. Cellar, shed and outdoors. Spare, full time, year round. We have 25,000 customers. Free Book. Washington Mushroom Ind., Dept. 180, 2954 Admiral Way, Seattle, Wash.

LEARN Mineralogy At Home. Diploma Course. Fortunes Being Made In Minerals. Free Catalogue. Mineral Science Institute, Desk 3, 159 East Ontario, Chicago 11.

PHYSICAL Therapy & Massage. We train you at home. Earn Big Profits From Your Own Private Practice or Work With Hospitals and Doctors. Free Catalogue. National Institute, Desk 3, 159 E., Ontario, Chicago 11.

TRANSFORM yourself via Subconscious Dynamics. Free amazing publication. Box 847 (A-9), Ocean Park, Calif.

IF you have a product or service that can be operated on a mail order basis, write me today. I will send you a Free Kit on "How To Make Money Out Of Classified Advertising". Next issue will be November. Closing date September 24th. Hurry—Do it Today! O. K. Kelly, Classified Adv., Mgr., Dept. 97, 353 Fourth Avenue, New York 10, N. Y.

46 CONTESTS

WIN contest money. General Contest Bulletin gives hundreds of tips. Lists current contests, rules. Sample (magazine 25c. General Contests, 1609-A East 5th, Duluth, Minnesota.

PRIZE Contests provide Fabulous and Confidential Home Income Opportunity! Here's How and Where to Win Your Share! Send stamp! National Contest Bulletin, Box 2685-PS, Miami 16, Florida.

47 DETECTIVES

DETECTIVE Training. Phillips Secret Service System, 1917-C North Kenneth, Chicago 39, Ill.

LEARN Civil and criminal investigation at home. Earn steady good pay. Institute Applied Science, 1920 Sunnyside, Dept. 336, Chicago 40, Ill.

DETECTIVES—Work home—Travel. Experience unnecessary. Detective Particulars free. Write Wagoner, P-125 West 86th, New York 24.

BE a detective. Write for free details. State age. National Detective Academy, 535 East 4th Street, Scottsdale, Arizona.

50 BUSINESS SERVICE, INFORMATION, NAME LISTS

WOMEN Mail Buyers' Names $5.00 thousand. Durite, 624 East 17th, Indianapolis 2, Indiana.

BEVERLY HILLS, California, Residents 1½c Each. Rural Small Town or Los Angeles 1c. Welland Allen, 2429 Workman Street, Los Angeles 31, California.

52 AUTHORS SERVICE

WRITERS: Book Manuscripts invited for publication on our cooperative plan. Greenwich Book Publishers, (Atten. Mr. Ibsen), 489 Fifth Avenue, New York 17, New York.

WANT Your Book Published? Learn how we publish, advertise, promote, distribute. Many successes. Free booklet PS. Vantage, 120 West 31, New York.

53 ADVERTISING, AGENCIES, ETC., FOR ADVERTISERS

FREE expert assistance for mailorder advertisers. Ratebook leading newspapers, magazines, 10c. Chicago Advertising Agency, Chicago 4.

ADVERTISE: 24 words, 100 Canadian Newspapers, $5.50. Lists Free. Advertising Bureau, 10511-P Springfield, Chicago 43.

54 CARTOONING, SIGN PAINTING, CHALK TALKS

"HOW To Make Money With Simple Cartoons"—A book everyone who likes to draw should have. It is free; no obligation. Simply address: Cartoonists' Exchange, Dept. 199, Pleasant Hill, Ohio.

PAINT Signs, Cartoons. Quickest way to learn. Trace letters. Learn to draw. $2.00. Sign Instruction, 4304 Virginia, Kansas City 10, Missouri.

POPULAR SCIENCE OPPORTUNITIES

YOU can Entertain with Chalk Talks. Catalog 10c. Cartoonist Balda, Oshkosh, Wisconsin.

55 TYPEWRITERS & OFFICE MACHINES

TYPEWRITER. Bargains! All Makes. List free. Woods Typewriters, Bedford, Pennsylvania.

$1.00 DELIVERS Brand New Portable Remington Typewriter. Balance $1.00 a week for 34 months. Send $1.00 to Sloan & Peters Company, Dept. #398, 301 Market Street, Newark, New Jersey.

56 RUBBER STAMPS & OFFICE SUPPLIES

THREE lines 75c postpaid. Stamps, 113 Wellington Hill, Boston 26, Massachusetts.

RITE-O-Stamp signature (Pocket Applicator) $1.00. A.B.Co., 67 Labelle, Buffalo 19, New York.

FOUR Lines With Business Emblem, $2.00. Details free. Alro, Box 566-P, Nyack, New York.

RUEBER Stamps, 3 Lines $1.00, 4-5 Lines $1.50, Indexed, Deep Moulded, Cushioned Mount, Clear Copy Guaranteed. James Moyer, R.D. 1, Pittsburgh 35, Pa.

THREE line name and Address. Metal or plastic pocket Case $1.00. Mated Mailers. Post Office Box 494, Buffalo 5, New York.

3 LINES $1.00. 4 or 5 Lines $1.50. Any Wording. Roughsedge's, 2 Lionel, Clark, New Jersey.

FREE Rubber Stamp Catalog. Reasonable Prices. Martin Sales, Eldred, New York.

THREE Line Cushion Mounted, Indexed Stamp One Dollar. Tesco Industries, 1803 Piedmont, Jackson 2, Mississippi. Or 871 Seventh Street West, Birmingham, Alabama.

INDEXED Cushioned 3 Lines $1.00, 4 Or 5 Lines $1.50. (Script or Print) Free Stock Stamp Circular. 1 Day Service. Youngers Stamp Shop, Princeton, Iowa.

57 PRINTING, MULTIGRAPHING, ETC.

500 NAME and Address Labels Printed $1.00. Johnston, Box 1996, Grand Central Station, New York 17, New York.

BUSINESS Printing, Rubber Stamps. Free Catalog. Brose, 196 Clerk Street, Jersey City 5, New Jersey.

1,000 EMBOSSED Business Cards, $3.95 postpaid. Stewart's, Box 5098, Kansas City 30, Missouri.

BUSINESS Printing. Samples. Prices Free. Howprint, 723-W Eunice, Webster Groves 19, Missouri.

GETTING Married? Invitations, Napkins, Thanks, Everything. Decco, Box 3315-S, St. Louis 3.

AMAZING Value 1,000 "Raised Letters" Business Cards, $3.50. Samples. Pioneer, Island Park 36, New York.

FAST Service! 100—8½x11 Letterheads $2.00. Raco Press (PS), 818 West Gift, Peoria, Illinois.

100 BUSINESS Cards $1.00. Print Shop, 1418 Broadway, Rockford, Illinois.

OFFSET printing $6.50—1000, 8½x11, 16 lb. National Letters, 251 W 42 St., New York 36.

1000 BUSINESS Cards—$2.95! Samples Free! Morey's, 2497 Roosevelt, Redwood City, California.

TOP quality printing, mimeographing. Free literature. Currier, PSM, New Lebanon Center, New York.

PRINTED Products. Free Catalog. John Peper, Box 822, Chattanooga 1, Tennessee.

BUSINESS, Personal Printing. W. Simons, 1027 Madison Street, Henderson, Kentucky.

1000 NAME and address labels $1.00. Ribble, 2121 Lewis, Saginaw, Michigan.

FREE Catalog Post Paid Printing. D M Press, Sebastopol, California.

500 ¾x2¼ FOUR line gummed stickers 50c. Red Border $1.00. Moritz Printer, Saginaw, Michigan.

100 LETTERHEADS (8½x11 Watermarked) And 100 Envelopes 6¾, Printed Carefully, $2.00 Postpaid. Race Printing, Hudson, New York.

IF you have a product or service that can be operated on a mail order basis, write me today. I will send you a Free Kit on "How To Make Money Out Of Classified Advertising". Next issue will be November. Closing date September 24th. Hurry—Do it Today! O. K. Kelly, Classified Adv., Mgr., Dept. 97, 353 Fourth Avenue, New York 10, N. Y.

58 PRINTING OUTFITS, SUPPLIES

DO your own printing. Save money. Simple rules. We supply everything. Print for others; good profit. Raised printing like engraving too. Have home shop. Details free. Kelsey Presses, V-8, Meriden, Conn.

RUBBER Stamp making presses, hydraulic operated, electrically heated. Sizes 5"x8", 8"x12", 10"x15" starting outfits. All kinds supplies. Custom Manufacturing, 601 N. Jefferson, Springfield 2, Missouri.

MAKE Your Own self-molding rubber stamps and printing cuts. Plexirubber, Argyle 2, Wisconsin.

59 PATENT ATTORNEYS

INVENTORS—Send today for instructive booklet "Patent Protection for Inventors" giving detailed patent information and outlining preliminary steps to take toward patent protection—also "Evidence of Invention" form. Victor J. Evans & Co., 341-K Merlin Building, Washington 6, D. C.

INVENTORS: Without obligation, write for information explaining the steps you should take to secure a Patent. John Randolph, Registered Patent Attorney, 207 Columbian Bldg., Washington 1, D. C.

INVENTION Record form free and "Patent Information Every Inventor Should Have." Carl Miller, Registered Patent Attorney, Woolworth Building, New York.

INVENTORS: Learn how you can protect your invention. A specially prepared booklet "Patent Guide for the Inventor" containing detailed information concerning patent protection and procedure together with "Record of Invention" form will be promptly forwarded to you upon request—without obligation. We are registered to practice before the United States Patent Office and are prepared to serve you in the handling of your patent matters. Clarence A. O'Brien & Harvey Jacobson, Registered Patent Attorneys, 72B-G District National Building, Washington, D. C.

INVENTORS—If you believe you have an invention, you should find out how to protect it. The firm of McMorrow, Berman & Davidson with offices in Washington, D.C., is qualified to take the necessary steps for you. Send for copy of our Patent Booklet "How to Protect Your Invention." We will also send you an "Invention Record" form. No obligation. They are yours for the asking. McMorrow, Berman & Davidson, Registered Patent Attorneys, 143-Z Victor Building, Washington 1, D.C.

C. A. Snow & Co.—S-427, Snow Building, Washington 1, D. C. Registered Patent Attorneys. Write for information.

"INVENTOR'S Guide" and "Record of Invention" free on request. Frank B. Ledermann, 154 Nassau Street, New York City.

INVENTORS: When you are satisfied that you have invented something of value write me, without obligation, for information as to what steps you should take to secure a Patent. Write Patrick D. Beavers, Registered Patent Atty., 938 Columbian Bldg., Washington 1, D. C.

PATENTS—Irving L. McCathran, 507 McLachlen Bldg., Washington 1, D. C. Registered Patent Attorney.

60 FOR INVENTORS

INVENTORS, if you have an invention for sale, patented or unpatented, write Institute of American Inventors, Dept. 30A, 635-F St., N.W., Washington 4, D. C.

INVENTORS—Send for free Patent Information book and Inventor's Record. Registered Patent Attorney, Associate Examiner, Patent Office 1922-1929; Patent Attorney & Advisor, Navy Department 1930-1947. Gustave Miller, 97PSI Warner Building, Washington 4, D. C.

INVENTORS—This firm is registered to practice before the United States Patent Office and available to assist you in the preparation and prosecution of your patent application. "Patent Protection for Inventors" booklet containing detailed information and steps to take toward patent protection sent promptly upon request. No obligation. Victor J. Evans & Co., 342-K Merlin Building, Washington 6, D. C.

INVENTION Record form free and "Patent Information Every Inventor Should Have." Carl Miller, Registered Patent Attorney, Woolworth Building, New York.

INVENTORS: Without obligation, write for information explaining the steps you should take to secure a Patent on your invention. John Randolph, Registered Patent Attorney, 206 Columbian Bldg., Washington 1, D. C.

WORKING Models. John Bell Models, 5800 Clemens, St. Louis 12, Missouri.

INVENTORS: Learn how you can protect your invention. A specially prepared booklet "Patent Guide for the Inventor" containing detailed information concerning patent protection and procedure together with "Record of Invention" form will be promptly forwarded to you upon request—without obligation. We are registered to practice before the United States Patent Office and are prepared to serve you in the handling of your patent matters. Clarence A. O'Brien & Harvey Jacobson, Registered Patent Attorneys, 72A-G District National Building, Washington, D. C.

INVENTORS—If you believe you have an invention, you should find out how to protect it. The firm of McMorrow, Berman & Davidson with offices in Washington, D.C., is qualified to take the necessary steps for you. Send for copy of our Patent Booklet "How to Protect Your Invention." We will also send you an "Invention Record" form. No obligation. They are yours for the asking. McMorrow, Berman & Davidson, Registered Patent Attorneys, 143-Y Victor Building, Washington 1, D.C.

INVENTORS Don't sell your invention Patented or Unpatented until you receive our offer, write Cowgill, Box 298, Marion, O.

FREE Patent Book. Write Blasius, 15-B Park Row, New York City.

"IMPORTANT information for all inventors." Inventors, 372 London, San Francisco 12, California.

INVENTORS—Save Time And Money—Concentrate On Your Best Ideas. Unbiased Professional Opinion. Inquire Consulting Engineer, Box 101, Santa Ynez, California.

SEARCHES—Put your patent searches in the hands of a Registered Patent Attorney or Agent as he qualifies to give a worthwhile patentability report. Record of invention form upon request and information on patent protection. Patrick D. Beavers, Registered Patent Attorney, 930 Columbian Bldg., Washington 1, D. C.

POPULAR SCIENCE OPPORTUNITIES

PATENT Searches including copies of nearest patents. $6.00. Reports airmailed within 48 hours. More than 100 registered patent attorneys use my service. For Free invention protection forms, write Miss Ann Hastings, P.O. Box 176, Washington 4, D. C.

PATENT Searches $5.00. 48-hour airmail service. Invention Protection forms free. Write Patent Engineering Service, 711 14th Street, N.W., Washington 5, D.C.

PATENT Searches $5.00. 48-hour service. Free Invention Protection forms. Write Raymond L. Smith, Patent Searcher, 620 Sheraton Building, Washington 5, D. C.

61 INVENTIONS WANTED

INVENTIONS wanted. Patented; unpatented. Tremendous Manufacturers lists. Global Marketing Service, 2420 77th, Oakland 5, Calif.

INVENTORS: Hundreds of manufacturers have requested our assistance in locating marketable new products. Complete information free. Institute of American Inventors, Dept. 30C, 635-F Street, N. W., Washington 4, D. C.

INVENTIONS wanted now by my Manufacturer-Clients. Patented. Unpatented. Write Gilbert Adams, Patent Broker, 80-R Wall Street, Financial District, New York City.

INVENTORS: If you have an invention for sale, patented or unpatented, write for free brochure outlining manufacturers' requirements, royalty rates. Kessler Corporation, 49-IW, Fremont, Ohio.

INVENTORS Don't sell your invention Patented or Unpatented until you receive our offer, write Cowgill, Box 298, Marion, O.

INVENTIONS Wanted. Patented or Patent Pending. 26 years experience Promoting Inventions. National Service Bureau, 3122 Meramec, St. Louis 18, Mo.

SUPERIOR promotions. Patented, unpatented inventions. Informative booklet, free. Superior, 338-342 North Rodeo, Beverly Hills, California.

WANTED new patentable ideas for doll carriages, children's tables, chairs and rockers by a reputable manufacturer. Send illustration with full details to L. G. Reuther, 3032-23rd Avenue South, Nashville 12, Tennessee.

INVENTORS! Manufacturers look to us for new ideas, patents. Nation-wide contacts. Write Inventors Creative Service, 354 South Spring, Los Angeles 13, California.

CASH Buyers for inventions. Write National Inventors Institute, Box 7007, Cleveland 28, Ohio.

LET Us help you sell your invention. We charge small commission. Bruce Sales Company, 2420 Greenview, New Castle, Indiana.

63 MANUFACTURING

DIES made, small intricate designs, blanking, trimming. Vice or press actuated. 2x3" approx. $30.00. Dimaco, 1511 Gernand, Danville, Illinois.

64 MODELS, MODEL SUPPLIES

SHIP and yacht model fittings; blueprints. Send 35c for Illustrated catalog #29 listing hundreds of items. A. J. Fisher, 1002-2 Etowah Ave., Royal Oak, Michigan.

SHIP Models. Most complete line in New England. Kits, fittings, plans, books, tools, engines, motors. 1958 illustrated catalog 35c. James Bliss and Co., Inc., Dept. PS, 342 Atlantic Avenue, Boston 10, Massachusetts.

LIONEL Trains. Big Discounts. Bulletin Free. Catalog 25c. Mack Brothers, 2041 Chicago Ave., Chicago 22.

SHIP Model kits and numerous fittings from authentic plans including clippers, trawler, fishermen, frigates, privateer, radio control tug, etc. Send 25c for our new 1957 catalog. Model Shipways, Folio P, 39 West Fort Lee Road, Bogota, N. J.

"ST" Steam engine castings, fittings, boat plans catalog 15c. Ship Models Ltd., 186 Summer, Andover, Mass.

POWER Models. Unusual steam, gasoline and traction engines, fittings, metals. Comprehensive catalog $1.00. Charles Cole, Ventura, California.

JUMBO Modelcraft Catalogs: Airplanes, Boats, Cars—25c. Railroad—25c. 10,000 Items. Bargains List Free. America's Hobby Center, 146L West 22nd Street, New York 11, New York.

"TT" Trains—Build a railroad on card table. 1/10 inch scale models as small as pack of cigarettes. Locomotives pull 100 car trains. Catalog 35c. R. McMinis, 221 Ralph, Belleville, New Jersey.

64A ENAMELS, PAINTS & VARNISHES

50 PAINT Strainers with permanent aluminum funnel, guaranteed $1.00 postpaid. M. McDonald, 201 E. El Morado, Ontario, California.

65 HOME CRAFTSMAN

ALL Crafts, Supplies. Large Free Catalog. National Handicraft, 199 William St., New York 38.

FREE "Do-It-Yourself" Leathercraft Catalog. Tandy Leather Company, Box 791-S22, Fort Worth, Texas.

WOODWORKING and Cabinetmaking course for beginning and advanced home craftsmen. Only complete low-cost home training program available. Write for free booklet. Interstate Training Service, Dept. G-2, Portland 13, Oregon.

LEARN Art Metalcraft and jewelry making. Complete, inexpensive, home training course now available. Special tools and materials furnished. Write for free booklet. Interstate Training Service, Dept. L-2, Portland 13, Oregon.

101 PATTERNS of Smart gifts, novelties, shelves, action windmills. Plus, "Make Money Jig Sawing", $1.00. Mastercraft, 95S, 7041 Olcott, Chicago 31, Illinois.

FREE. New big illustrated catalog. Leathercraft, Metalcraft, Woodcraft kits and supplies. Complete stock, top values, latest ideas. Write today. J. C. Larson Co., Dept. 7326, 820 S. Tripp, Chicago 24.

FREE Power Tool price list. Unique gift offer! Laircraft, Box F-5008, Detroit 35, Michigan.

FREE Catalog. 1,663 Artist-drawn Patterns, Designs. Craftplans, 1321-B Wabash, Chicago 5.

SQUAREKNOTTERS: Make belts, handbags, lanyards, dog leashes, etc. Special offer! Beginner's book, catalog and quality cord samples 25c. P. C. Herwig Co., Dept. 71-P7, 39 Henry St., Brooklyn 1, New York.

KNOCKDOWN cedar chest and lumber free price list. Bedford Lumber Company, Shelbyville, Tennessee.

STYLECRAFT "Pretraced" leather kits. Handbags, Billfolds, Filigree Belts. Patterns on leather. Just carve, assemble and lace. "Precarved" kits also available. Send 25c for catalog, free folder. Refunded first order. Apache Leather Company, 2804 E. Washington St., Phoenix, Arizona.

LEATHERCRAFT, Cooper Enameling, Mosaic Tile, Metal Tooling. Many More Crafts. Complete Illustrated Catalog 10c. Kit Kraft, 329, Studio City, California.

IF you have a product or service that can be operated on a mail order basis, write me today. I will send you a Free Kit on "How To Make Money Out Of Classified Advertising". Next issue will be November. Closing date September 24th. Hurry—Do it Today! O. K. Kelly, Classified Adv., Mgr., Dept. 97, 253 Fourth Avenue, New York 10, N. Y.

66 BUILD IT YOURSELF

GRANDFATHER clock movements, barometers, blueprints, kits. Wholesale catalog 25c. Mason-Sullivan, Noroton 2, Connecticut.

MELT Cast Iron, Brass, Aluminum. Make castings for profit. Free literature. Ursutz Burner Company, Box 566-S, Tempe, Arizona.

ATTRACTIVE, All Weather, Outdoor Incinerator From Any Discarded Oil Drum. Unique Design. Plans $1.00. E. Loper, Box 76, Alloway, New Jersey.

BUILD A Flying Saucer Early Warning Magnetic Detector For Less Than Ten Dollars. Plans And Instructions $2.00. Bassett's, 627 N. 10th, Manitowoc, Wisconsin.

MOWER Kits And Parts. Also Complete Mowers. Write For Free Plans And Literature. Triangle, Box 185, Fort Scott, Kansas.

EXPERIMENT with New Engine Design. Long censored "Power Package Unit". For model or standard cars, boats, aircraft, or homes. Blue Prints $5.00. General Power Systems Co., Box 1585, Santa Ana, Calif.

WELDERS, make ornamental iron post, etc. Catalogue fifty cents. Bender Machine Shop, 1018 Wheeler, Fort Smith, Arkansas.

67 OLD GOLD, JEWELRY, WATCHES, ETC.

HIGHEST Cash For Old Gold, Broken Jewelry, Gold Teeth, Watches, Diamonds, Silverware, Spectacles, Platinum, Mercury. Free information. Rose Refiners, Heyworth Bldg., Chicago 2.

USED and new watches $2 up. Free List. Southern Watches, Gray 2, Georgia.

PREFERRED source for quality settings and stones. Manufacture costume jewelry at home. Extensive catalog 25c. A. V. Cutt Co., 210-T Fifth Ave., New York 10, N.Y.

COSTUME Jewelry Supplies. Settings, Rhinestone, etc. 88 page illustrated catalog. 25c. Milady, Box 1328, G.P.O., New York City (1).

WHOLESALE quality Jewelry Findings, Chains. Fraternal, Religious Emblems. Catalog 10c, refundable. PS-9-7, Caraday, Box 22, West Hempstead, New York.

GOLD, Silver, platinum, Diamonds Wanted. Cash Immediately. Highest Prices. Appraisals Made. Free Information. Wilmot's, 1067 Bridge N.W., Grand Rapids 4, Michigan.

69 FOR THE HOME

FOAM rubber furniture cushions—Factory seconds 50% discount. Free catalog. Perma-Foam, 390-A Nye Ave., Irvington, New Jersey.

WATER Softener $29.95. Home, cabin, trailer. Returns cost three times a year. Free literature. Myers, Box 671-PS, Indianapolis 6, Indiana.

70 OF INTEREST TO WOMEN

MAKE $25 to $35 weekly addressing envelopes. Our instructions reveal how. Glenway, Box 6568, Cleveland 1, Ohio.

FREE—Big New Wholesale Catalog! Up to 50% saving for you, family, friends on nationally-known gifts, jewelry, toys, appliances, Christmas cards etc. Also make money selling part time! Write: Evergreen Studios, Box 846-E, Chicago 42, Illinois.

60% PROFIT On Cosmetics—Famous nationally advertised Hollywood Cosmetics pay 60%! Make $25-day up! Hire others. For free samples, details, write Studio Girl, Glendale, California, Dept. 1179O.

DRESSES 24c; Shoes 39c; Men's suits $4.95; trousers $1.20. Better used clothing. Free Catalog. Transworld, 104-T Christopher, Brooklyn 12, New York.

NEW Beautiful Aurora Borealis Crystal Rosaries. Sterling Silver Chain, Center Piece, Crucifix. Gift-Boxed. $12.50. Others $1.00 up. Murphy, 555 Orange, Newark 7, New Jersey.

POPULAR SCIENCE OPPORTUNITIES

MONEY, Typing—Sewing! Details Free! Edwards, 3912-PS, 12th, Des Moines 13, Iowa.

$200 MONTHLY Possibly, Sewing Babywear! No house selling! Send stamped, addressed envelope. Cuties, Warsaw 14, Indiana.

WE Pay $3.50 lb. dried. Grow Mushrooms. Cellar, shed and outdoors. Spare, full time, year round. We have 25,000 customers. Free Book. Washington Mushroom Ind., Dept. 181, 2954 Admiral Way, Seattle, Wash.

71 FOR SALE MISCELLANEOUS

MEN—buy her genuine diamond jewelry for Christmas at ½ price. Ask for catalog 42-P. Hofstede's, 928 Belmont Ave., Paterson 2, New Jersey.

72 WANTED TO BUY

SCRAP Mercury (Quicksilver) containers supplied—Tantalum, Tungsten, Silver, Platinum. Metallurgical Products Company, Established 1909, 35th & Moore Sts., Phila. 45, Pennsylvania.

TOP prices paid for old copies of Popular Science—need only issues from period 1890 to 1915. If books are complete, even though condition is not perfect, please write us and describe what you have. Do not send the issue until you hear from us. Write to Box 306, Tuckahoe, New York.

QUICKSILVER, Sterling, Silver Solders, precious metals, Mercury Terminal, Norwood, Massachusetts.

77 GEIGER COUNTERS & TREASURE FINDERS

FIND Buried Treasure, gold and silver, with Goldak's sensational 3½ lb. "Find-It" locator, only $64.50. Write for free literature on complete line of mineral, metal locators; Geiger and scintillation counters. Goldak, 1540 W. Glenoaks Blvd., Glendale, California.

LITHIUM — The wonder metal. Free booklet describes prospecting information, uses, etc. Nu-Age, Box 142, North Battleford, Sask., Canada.

FOR Treasure Locators, Geiger, Scintillation Counters, Mineralights, M-Scope, Fisher Research Laboratory. See Advertisement, Page 000.

GOLD, silver, metal detectors. Geiger counters for uranium. Violites. Sensational new fully guaranteed models. None finer. Information free. Detectron Corp., 5528 Vineland Ave., North Hollywood, Calif.

FIND lost or hidden treasure with new, improved metal detector. No ground pick-up. Also, underwater metal detector. Free literature. Gardiner Electronics, Dept. 1, 2545 E. Indian School Road, Phoenix, Arizona.

TREASURE Locators. Free Literature. Sierra Scientific, 5415 York, PS18, Los Angeles 42, California.

FREE Literature—Lightweight, guaranteed Metal Detectors. Geiger Counters and Mineralights. Kits and Assembled Models. Electronic Applications, Dept. S, Box 8, Arlington 10, Virginia.

78 WATCH REPAIRING

WATCH and clock repairing books. Free catalog. North American, 2320-BK, Milwaukee, Chicago 47, Illinois.

WATCHMAKERS' — Jewelers' — Machinists' Tools. Watchmaking Course. Catalog 25c. Bengal, Culver City, Calif.

79 MISCELLANEOUS

FREE Wholesale Catalogs! Sporting Equipment — Cameras — Homewares — Everything. Econ-O-Mart, Whippany 6, New Jersey.

BUY Wholesale! Over 10,000 Nationally Advertised Products. Appliances, Cameras, Sporting Goods, Housewares, Watches, Typewriters, Tools, Clothing, etc. Send Postcard Today. Buy-Rite, Box 258, Hawthorne 6, New Jersey.

REVOLVING Chimney caps, Clocks, Watches, Repairing. Catalog Free. G. D. Shrawder, Richfield 1, Pa.

SNOW Cone Machines. All Prices And Sizes. Special For Grocery Stores. Box 7803, Dallas, Texas.

RE-Usable Plastic Cover 9x12 Feet. 1000 Uses Outdoors Or Indoors—Transparent, Waterproof, Economical—Protects Cars, Boats, Farm Machinery—Covers Car Seats & Furniture. Rush Only $1.25. Postage Prepaid. Bargains, 7132 Southeastern Ave., Hammond, Indiana

"WINEMAKING," $1.00. "How to Make Beer—Ale," $1.00. Illustrated. Eaton Publications, Box 1242-U, Santa Rosa, Calif.

MARSHMALLOWS and Marshmallow frosting. Make your own from kitchen tested recipes. $1.00. Korner Candy, P.O. Box 3646 Loring Station; Minneapolis 3, Minnesota.

BIG Money raising fishworms and crickets. Free Information. Carter Farm-12, Plains, Georgia.

RECEIVE Mail, magazines, catalogs, opportunities, 10c. Star Mailers, Leming, Texas.

TERMITES and other pests destroyed by a new method without costly or dangerous poisons, so simple you can do it yourself. Works on buildings that specialists say can't be controlled. Also original handy hints for homes, gardens, orchards and farms. For copyrighted book with complete instructions, send $1.00 to—Charles Madgwick, 524 Olive Street, Santa Barbara, California.

MAKE Your Will. Easy "Fill-In" Form. Instructions $2.00. Will Kit, Box 62B, Cliffside Park, New Jersey.

U.S. Civil Service tests! Free catalog. Di Medio, 1748 Jarvis, New York 61.

LIKE full mailboxes? Interesting "offer-tunities" galore 25c. Traylor Enterprises, La Feria 2, Texas.

SOLAR Engine! $2.00. Details Free. Mailaway, Box 79, Bethpage, Long Island.

WE Pay $3.50 lb. dried. Grow Mushrooms. Cellar, shed and outdoors. Spare, full time, year round. We have 25,000 customers. Free Book. Washington Mushroom Ind., Dept. 182, 2954 Admiral Way, Seattle, Wash.

HAVING trouble making ends meet? Do you wonder where your money goes? Joe's wheel of Family Finance guaranteed to help increase your buying power. Send $1.00 to P.O. Box 694, Charlotte, North Carolina.

CESSPOOLS, septic tanks, outdoor toilets cleaned, deodorized without digging, pumping or moving. Free details. Chemical Cesspool Cleaning Company, Boston 34, Massachusetts.

RECEIVE—Magazine Samples, Mails, Catalogues, Offers From Everywhere. Get Listed 25c. Rorick's, Cincinnati 26, Ohio.

BOOKS on antiques and their prices. Free circular. Warman Publishers, Uniontown, Penna.

MIRROR one side; transparent other side. Photograph people unawares. 8" x 10", $2.00. 16" x 20", $5.00. One-Way Mirror, PS-957, Box 635, Mt. Vernon, New York.

GOOD jobs, opportunities galore in Metropolitan St. Louis. "Gateway to the West." Largest Sunday classified airmailed, $1.50. Fool your friends—remails from Flat River, Missouri, Ozark hillbilly center and "Lead Mining Capitol of the World." 25c. Expeditor, Box 726, Flat River, Missouri.

GERMAN address lists, anything manufactured 25c. Burke Associates, Manchester 2, Massachusetts

METAL Hurricane Charts — Movable magnetic plotting markers. Gyco, Palm Beach, Florida.

IF you have a product or service that can be operated on a mail order basis, write me today. I will send you a Free Kit on "How To Make Money Out Of Classified Advertising". Next issue will be November. Closing date September 24th. Hurry—Do it Today! O. K. Kelly, Classified Adv., Mgr., Dept. 97, 353 Fourth Avenue, New York 10, N. Y.

80 PERSONAL

PSORIASIS Sufferers: Discouraged? Write for Free important information today! Pixacol Co., Box 3583-BP, Cleveland 18, Ohio.

MEXICAN Legal Matters. A. Espejo, Box 217, P.S., Tijuana, Mexico.

"HOW Can I Find Out?" You Can! Information confidentially developed. Any matter, person, problem. World-wide. Officially licensed. Established 1922. William Herman, 170 Broadway, New York.

BEAUTIFUL Florida-Alabama Color Pinups And Scenes Mailed 10 For $1.00. Remails 20c Each. $3.00 Per Month. Any Florida-Alabama Classified Airmailed $1.00. Hanco, 607 McCarroll Road, Pensacola, Florida.

LEARN While Asleep! Details Free. Research Association, Box 610-K, Omaha.

"RULE others with thoughts." (Telepathy.) Details—stamp. Wisdom, 846-56 Sunnyside, Chicago 40.

SECRET Mail Receiving Forwarding System. $3 Month. Hedgpeth, Box 830, Alhambra 24, California.

LETTERS Remailed 25¢. J. Love, 1419 E. 83d, Los Angeles 1, California.

KADOODLESNITCH remails $.25. Free particulars. 117 Columbia, Hamburg, Wanakah, New York.

NIAGARA Falls Remails 25c. Burr, Box 236A, Niag. Sq. Station, Buffalo, New York.

GET More Out Of Life. Eliminate fear and worry, overcome limitations, develop confidence and faith, establish harmonious happy home, improve health, attract friends, gain security, attain peace of mind. Send $1.00 for 100-page book. Guaranteed to satisfy or money back. Ask for "Steps To Heaven." Ontology Foundation, Homewood, Illinois.

BIBLE reveals Time of End! Exact Year, Month, Date sent free! Write: Harvest, Jefferson City 2, Missouri.

"POCKET Secretary" With 6 Ball Pens $1.25. Golf Balls—Solid Center $4.25 Dozen. Request Bulletin 619A. Par-Kee Company, 6518 South Honore, Chicago 36, Illinois.

NEED money? Sell your old unwanted gold watches, rings, gold teeth, etc., for big cash. Write for details or send your gold to: Old Gold Agency, 14 Johnson St., Fitchburg, Massachusetts.

JOBS, Homes, Opportunities Galore, Los Angeles Classified Ads Airmailed. Send $1.00. Hansen, 7911 VanNess Ave., Inglewood, California.

READ Anyones Mind! Complete Instructions $1.00. ABC Publications, Box 849, San Francisco 1-L, Calif.

MEXICAN Law. General Practice. Lic. Ceniceros, Apartado 79, C. Juárez, Chih., México.

LETTERS remailed San Francisco 25¢. G. Mott, 1137 Sir Francis Drake, Kentfield, California.

REMAILS 25¢. Receiving, Forwarding, $3.00 Month. Hale, Box 1, Glenmont, New York.

MAKE Wine-Beer. Complete Instructions $1.00. ABC Publications, Box 849, San Francisco 1-K, Calif.

COLDS Controlled. Original Report, $2. Kendez, Box 176, Cicero, Illinois.

OPPORTUNITIES—Los Angeles. Classifieds $1.00. R. Ziegler, 1082 Gladys, Long Beach, California.

IF you have a product or service that can be operated on a mail order basis, write me today. I will send you a Free Kit on "How To Make Money Out Of Classified Advertising". Next issue will be November. Closing date September 24th. Hurry—Do It Today! O. K. Kelly, Classified Adv., Mgr., Dept. 97, 353 Fourth Avenue, New York 10, N. Y.

NRLDA

ANNUAL FALL HOME IMPROVEMENT PROGRAM

Join the millions of other Americans in this Fall Home Improvement Program. Dealers displaying the insignia below will be part of the program offering you GIANT values . . . friendly service . . . quality at no premium . . . and prompt, courteous service.

Stop by your favorite participating dealer. Make him your One-Stop Building Materials Center . . . for materials, tools, equipment and sound advice on all your home-improvement plans.

You'll find your lumber dealer always happy to help you remodel your home, add a basement game room, turn the attic into a bedroom. Your home-town lumber dealer is the man to help you "ADD NEW LIVING SPACE TO YOUR HOME!"

BUILD · PLAN · IMPROVE Your Home · Make Home
YOUR AUTHORIZED LUMBER DEALER
Building Materials Tools & Equipment for all Home Improvements

NRLDA
National Retail Lumber Dealers Association
18th & M Streets N. W., Washington, 6, D. C.

Lofty Enlarger Blows 'Em Up Big

You can make whopping big blowups if you mount your enlarger on the ceiling as I did. I have a table under it that holds the easel for regular work. By moving the table aside I can project down to the floor. The ceiling mount is steady, eliminating jars and vibrations that often fuzz images.

The enlarger column can be quickly removed from its base and bolted to a cleat across two ceiling joists, or it can be suspended from a husky wall bracket if the room has extra high ceilings. When I have finished working, I just slide the enlarger up, and it's out of the way.—*C. G. Bucher, White Plains, N. Y.*

Wire Paddle Mixes Paste

Instead of mixing wallpaper paste with my hands, I use a paddle made by bending down the ends of a metal coat hanger. This wire stirrer beats up a smooth, lumpfree paste, and I can start papering without a messy cleanup job.—*C. F. Stankoven, Elkhart, Ind.*

Food Colors Tint Photo Prints

Sparkling color tints can be added to black-and-white photo prints by dunking them in water mixed with a few drops of food coloring. Let them soak for five minutes; then blot and dry them. Before you submerge your best enlargements, experiment with a few small prints to determine how much coloring is needed to get just the tint that pleases you.

Plaster Is Soldering Clamp

Metal parts can be held firmly in alignment for soldering by bedding them in "investment" plaster—available at dental-supply houses. Mix the plaster with water as directed on the can. When it thickens, pour it onto a sheet of glass. Arrange the metal parts as the plaster sets. After soldering the assembly, free it with a knife.—*Hugh Botts, NYC.*

REMOVABILITY
MAKES THE ENJOYABLE DIFFERENCE

REMOVABLE R·O·W® WOOD WINDOWS

WITH LIF-T-LOX® WINDOW BALANCE

R·O·W wood windows feature lift-out sash

Paint, reglaze and wash your windows the easy way. No more troublesome ladder climbing—no more dangerous balancing on sills with R·O·W Removable Wood Windows. Just press sash to left and lift out for easy handling. Sash replacement is just as simple.

Other features of R·O·W Windows are rust-and-corrosion-free wood, natural insulation, styling versatility, finger-pressure operation and snug weather seal.

These most-wanted features are yours at no premium in R·O·W Wood Windows. See them at your building supply dealer.

R·O·W and LIF-T-LOX are the registered trade-marks of the R·O·W Sales Company

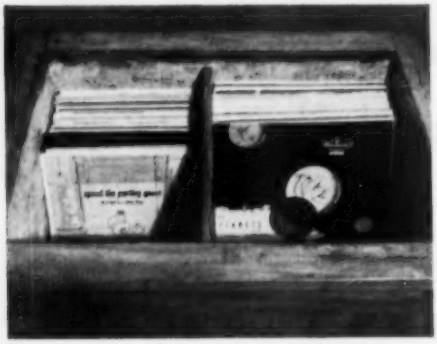
R·O·W SALES COMPANY · 1353 ACADEMY · FERNDALE 20, MICHIGAN

Hot Music Goes in Cold Box

A HI-FI fan on a budget, I salvaged two ancient iceboxes and housed all the parts of my set in solid oak.

I mounted the turntable in the top of an upright box and cut out a panel below it for my FM. Two shelves inside the lower door hold a pre-amp, 45-r.p.m. changer and an AM tuner. Wires go down the drain to the amplifier on the floor.

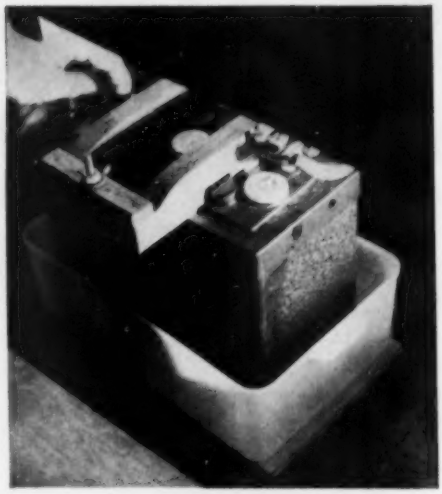
A low ice chest (below) fitted with a partition holds records. The hinged lid folds back to open one side or lifts off entirely.—*D. K. Slifer, Woodbury, N. J.*



LOW ICE CHEST has an off-center partition to make compartments for 10″ and 12″ platters.

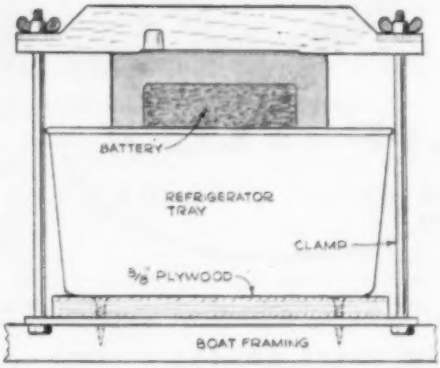
▶▶▶A closet within a closet may be the answer if you're short on space for storing woolen blankets and out-of-season clothing. Many older homes have a walk-in closet, one side or the back of which can be partitioned off and made into a cedar compartment. A two-piece door hinged down the middle may be needed for space reasons. Be sure it fits tightly and can be kept shut through the season.

▶▶▶SAVE scraps of perforated hardboard for your redecorating kit and you'll have convenient holders when painting bolt-on objects like drawer pulls and cabinet handles. Slip their bolts through the hardboard holes and secure them with nuts. That way, you won't have to handle the objects themselves during painting and drying.—*T. L. Jones, Kearny, N. J.*

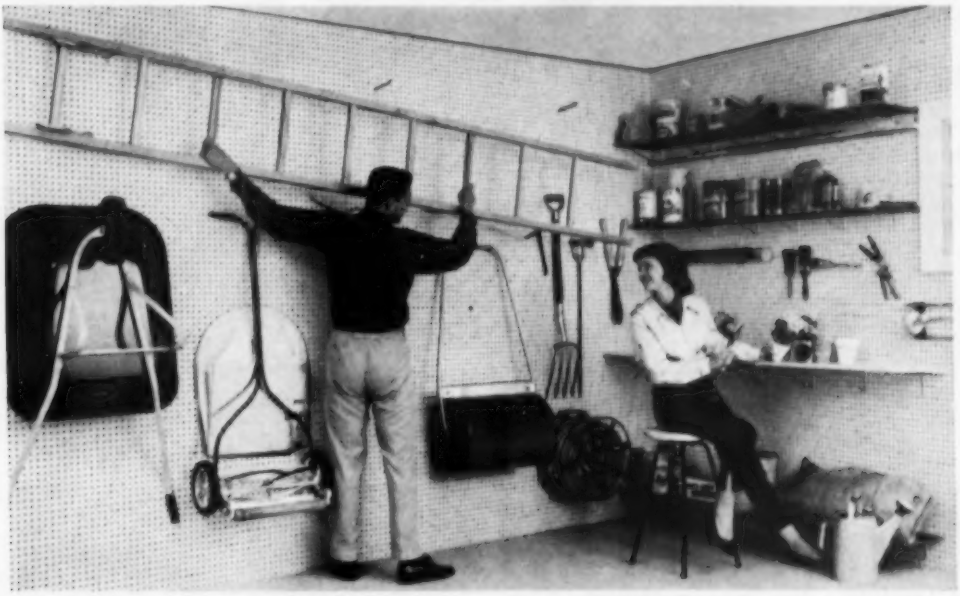


Plastic Encases Boat Battery

THE light, acid-proof case for my boat battery used to be a plastic refrigerator bin. It sits on a plywood base screwed across two of the boat bottom's frame members. A wooden bridge over the battery is clamped with two long bolts to a wood strip under the base. A U bolt could have been used for the clamping, too.—*E. F. Lindsley, North Prairie, Wis.*



There's an easy answer to this tough storage problem



Let MASONITE® Heavy Duty PEG-BOARD® put garage walls to work

You can have 33% more storage space with ¼" heavy-duty Peg-Board panels and accessories for as little as $27.00.* Clever slip-in-a-hole fixtures support just about anything—your heaviest garden tools, shelves and equipment, bench top and hand tools—and there you have it, a Working Wall! Enjoy a neat, attractive garage, and quickly, too; just ask your building materials dealer about heavy-duty Peg-Board panels and fixtures. Mail the coupon below for other interesting ways to use Peg-Board products.

***Wall area 8' x 12'. Heavy-Duty ¼" Peg-Board Panels $24.60. Accessories $1.96**

®Masonite Corporation—manufacturer of quality panel products

MASONITE® PRODUCTS

MASONITE CORPORATION
Dept. PS-9, Box 777, Chicago 90, Ill.
In Canada: Masonite Corporation, Gatineau, Quebec

Please rush me a copy of the "Home Owners' Guide to Masonite Peg-Board Panels and Fixtures."

Name .....

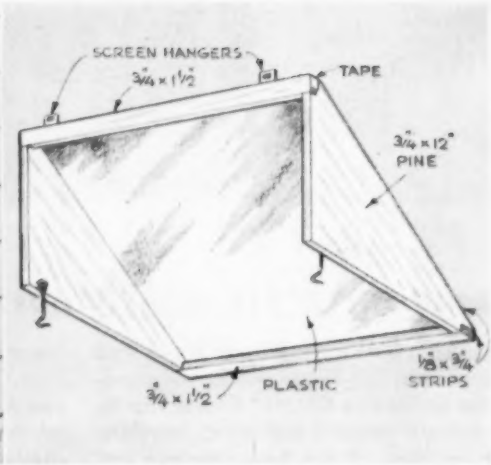
Address .....

City ..... *State* .....

Zone ..... *County* .....

Bark on Tape Warns Off Thieves

After several burglaries, one store owner put in a new kind of alarm—a tape recording of a barking dog. A switch is concealed by a rubber-mat step plate that closes a low-voltage circuit. This operates a relay that turns on power to start the recorder. When the shop is locked up at night, the recorder is set to "on" and the volume is turned up high. Potential burglars, hearing the vicious bark with its threat of immediate action, take off fast. He's had no further trouble with night callers.—*Henry Josephs, Gardenville, Pa.*



Awning Lets in Winter Air, But Sheds Rain or Snow

Hang a rain awning on the screen fixtures outside your bedroom window and you can have fresh air even on wet or snowy nights. Make it of translucent plastic on a wood frame, keeping the width that of the screen the unit replaces.

Cut the sides at 45 degrees and notch the upper and outer corners to take cross braces. Glue and nail the supporting braces in place, fasten screen hangers to the front of the upper brace, and give the wood frame two coats of outdoor paint.

Fasten the plastic to the sloping framework with rustproof tacks, and brad molding to the edges on three sides. Run adhesive tape over the plastic on the top cross brace, carrying it overside, and tack it down. Paint both molding and tape.

A hook fitted into an eye on the parting strip of the window will keep the unit from blowing upward and banging in windy weather.—*W. H. deFontaine, NYC.*

IF YOU *like to build the models...*

work on the big ones...and start a great future...

in the **U. S. AIR FORCE**

If you have mechanical ability, electronic ability—or both—the U.S. Air Force offers you unparalleled opportunities to develop your skills and train for an exciting and rewarding career. Whatever your future may be, *you'll go places faster* with the experience you gain in the U.S. Air Force. In addition, you will have the chance for interesting travel, further education and all forms of recreational activity. Get on the all-volunteer, *young* men's team! See your Air Force Recruiter, or mail the attached coupon, now.

Airman Information, P.O. Box 7608, Washington 4, D.C. M-96-P8

Please send me more information on my opportunities for enlisting in the U.S. Air Force. I am between the ages of 17-34 and reside in U.S.A. or possessions.

Name_____

Address_____ Age_____

City_____ Zone____ State_____

You'll never outgrow a Kodak Retina Camera!

Two great Kodak Retina models to choose from—each the heart of a *complete system* of photography...

"The most exciting camera I've ever used!" That's how Kodak Retina owners describe this camera.

Whichever famous model of Retina you choose, you'll enjoy the wonderful feeling of confidence that goes with owning a truly top-quality picturemaker. And as the heart of a *complete system of photography*, a Retina's versatility is almost limitless. Whatever field of 35mm picturemaking intrigues you next month . . . next year . . . you'll have a camera thoroughly capable of helping you explore it.

Ask your photo dealer to demonstrate the host of exciting picture-taking features that are available *only* in the Retina. And ask, too, about the wonderful family of special Kodak Retina Photo Aids described on the next page. They'll open the doors to a lifetime of new picture-taking adventures.

Kodak Retina IIc Camera *f*/2.8, $132 —*or as little as $13.20 down*. Retina IIIc Camera, *f*/2 with built-in exposure meter (shown above), $175—*or as little as $17.50 down*. See these famous Kodak Retina Cameras *soon*.

From table-top close-ups to telephoto views . . .

These—and many other—Kodak Retina Photo Aids will help you enjoy new adventures in picture taking!

Kodak Retina Curtar Lens Component, 35mm f/5.6—Takes only a jiffy to switch to this lens component for wide-angle views indoors, panoramic shots outdoors. Focuses 2½ feet to infinity, **$59**

Kodak Retina Longar Lens Component, 80mm, f/4—R-e-a-c-h-e-s across space for telephoto close-ups of distant scenes, candid shots of children and pets. Focuses from 6½ feet to infinity, **$80**

Kodak Retina 35-80 Optical Finder—Fits clip on top of camera to show field covered by 35mm and 80mm lenses. Complete with leather case, **$15.50**

Kodak Retina 50-80 Sports Finder—Folding, open-frame finder shows field of action covered by 50mm and 80mm lenses. With leather case, **$8.25**

Kodak Retina Close-Range and Viewfinder Kit, Model B—Two auxiliary lenses for short-range photography, plus parallax-correcting viewfinder combined with rangefinder to fit clip on top of camera, **$36.50**

Kodak Retina Close-up Kit, Model B—Wonderful for hand-held close-up work. Complete with field-guide holder, field guides and auxiliary lenses for picture taking from 4 fixed film-to-subject distances from 11¼ down to 5 15/16 inches, **$42.50**

Kodak Retina Microscope Adapter Kit, Model B—Contains everything needed to adapt a Retina to nearly any microscope for producing photomicrographs, **$62.50**

Kodak Retina Flasholder Bracket—Complete with cords and tips for attaching your choice of a variety of Kodak and Kodalite Flasholders, **$2.95**

Kodak Retina Field Case, Model B—Fully protects your camera, yet keeps it ready for instant action. Finest quality top-grain cowhide, metal trimmed and reinforced, **$14.50**

Many other Kodak Retina Photo Aids are available—filters, lens hoods, lens hood extension, filter cases, etc. See your photo dealer.

Prices are list, include Federal Tax where applicable, and are subject to change without notice.

Close-up made with one of the field guides and auxiliary lenses in the Kodak Retina Close-up Kit

Regular view with the Kodak Retina 50mm lens that comes with the camera

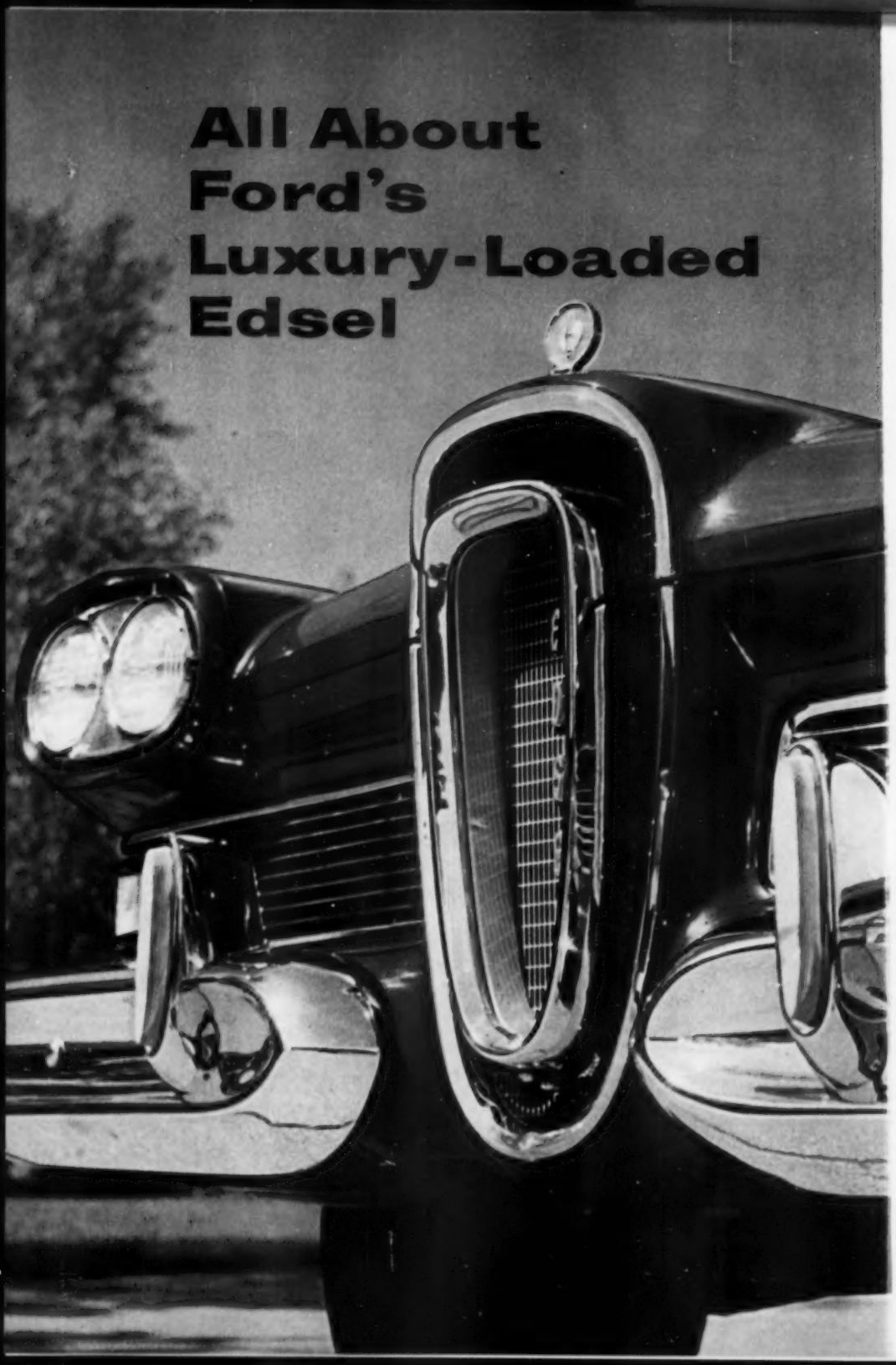
Wide-angle view with the auxiliary Kodak Retina Curtar Lens Component, 35mm, f/5.6

Telephoto view with the auxiliary Kodak Retina Longar Lens Component, 80mm, f/4

Kodak
TRADE MARK

EASTMAN KODAK COMPANY, Rochester 4, N.Y.

All About Ford's Luxury-Loaded Edsel



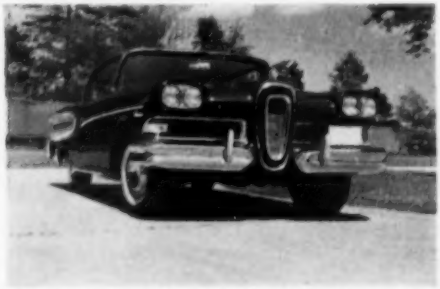
Rear running lights form gull wing, with turn signals outboard. Backup lights are below lid.

Whopping-big engines power four lines of cars with gadgets galore, styling that reverses a trend to horizontal grilles

By Devon Francis

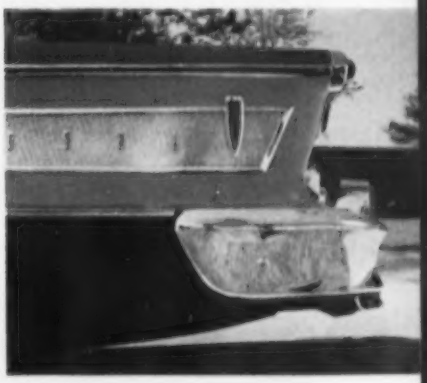
AFTER six years of mulling things over and three years of active work, the Ford Motor Co. last month finally took the wraps off its new medium-priced automobile, the Edsel. Then everybody concerned, from President Henry Ford II on down, sat back hopefully, and apprehensively, to see how much of a stir their glittering piece of hardware would create.

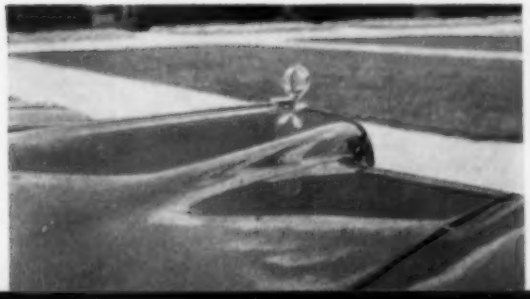
They needn't have worried. Millions of people wanted a look. A well-calculated series of "leaks" on features of the Edsel for months prior to its introduction paid off in public interest. The car had been,



WIDTH of 79.8 in. for Corsair and Citation models exceeds that of most competitive cars.

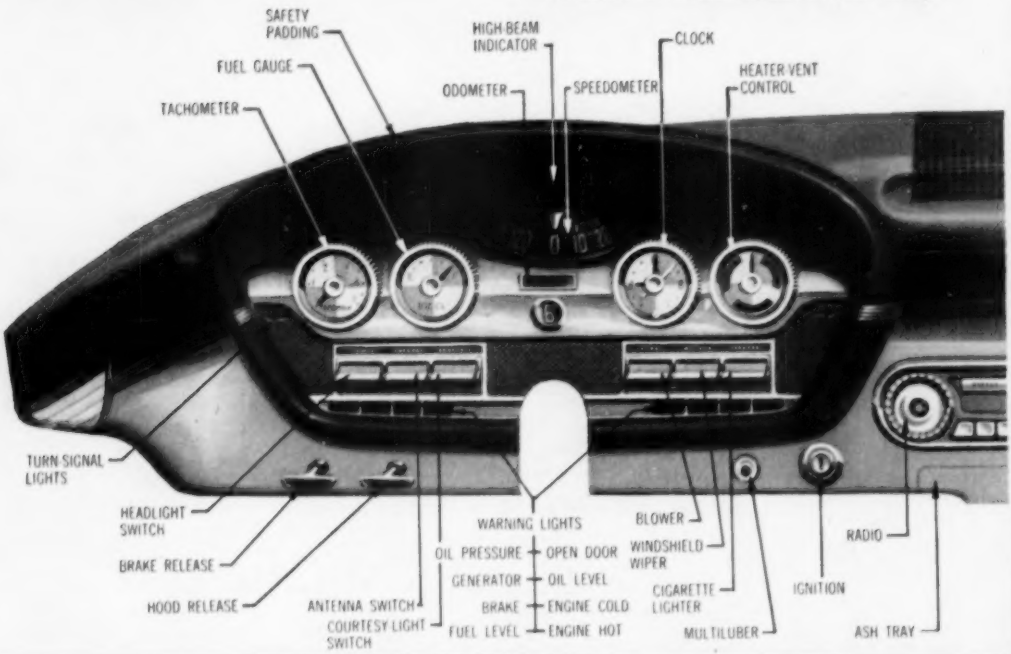
REAR FENDERS are sculptured, finless. Trim combinations are designed to prevent possible color "clashes."





BULGE IN HOOD is intended to better the driver's "sense of direction."

Array of instruments and controls in narrow panel area resulted from studies to keep



thanks to this, Detroit's worst-kept secret.

Still, what people saw when they looked was a shocker. The car has all this:

- More engine power than the average motorist will know what to do with.
- Gadgets beyond a gadgeteer's dreams of glory.
- Styling that reverses the years-long trend to horizontal-pattern front ends, and chrome enough to tax the output of the world's mines.

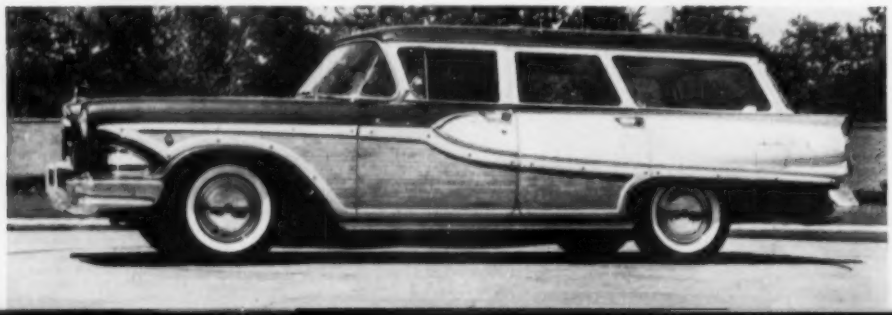
The first complete line of cars under a new name in a decade, the Edsel—to use a horse-breeding term—is by Jaguar out of Alfa Romeo. Of the two engines available, the *smaller* has practically the same cubic-inch displacement as the current Buick, Cadillac, Chrysler Saratoga, Lincoln or Packard Clipper. The bigger is bigger than the biggest of all other passenger-car engines now on the market.

The respective horsepowers: 303 and 345.

Why so much power? One Edsel executive, surprised at the question, replied, "I haven't heard the reasons discussed."

They're obvious in the performance, though. The car takes off like a gazelle one jump ahead of a drooling lion. There are four "lines" or series. The lower two lines,

Five station wagons, in six- and nine-passenger versions, are among Edsel's 18 models.



everything easy to see or reach

PUSHBUTTONS for transmission, centered on steering wheel, actuate electrical relays.

MINIMUM OF STRETCH gives access to heater dial, parking-brake release (foot-applied), hood release, headlight and other switches. Speedometer resembles a ship's compass in binnacle mounting. Tach, of course, is optional.

HEATER-DEFROSTER CONTROLS (air-conditioning is optional) are combined except for blower.

the Ranger and the Pacer, fitted with the smaller engine, accelerate from zero to 60 miles an hour in 9.5 seconds.

That's 2.1 seconds better than the 1957 Buick Special, a second better than the Chrysler Windsor, 1.1 better than the Olds Super 88. It matches the Pontiac Super Chief.

The top lines, the Corsair and the Citation, with the bigger engine, reach 60 from taw in 8.8 seconds.

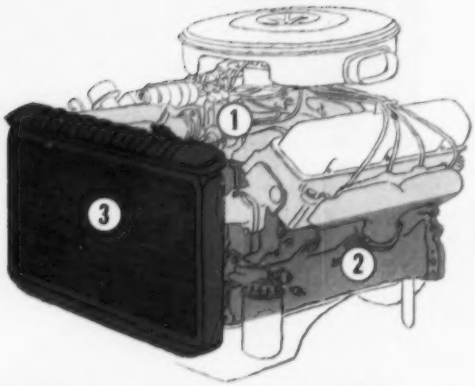
In deference to various state legislators —who are brooding about limiting horsepowers by law—the Edsel's top speed must remain sh-sh.

As shades of things to come, the smaller engine has "an interchangeability of block" with the plushier 1958 Fords.

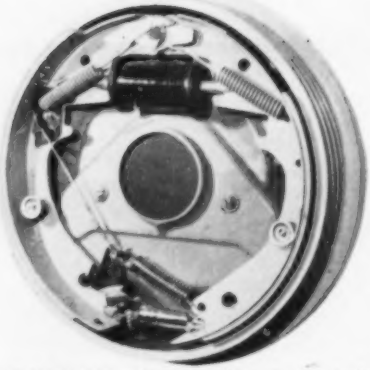
The car's ride matches its acceleration. The Edsel is cat-footed, solid on the straightaway, and as upright as an archbishop on the hard turns. The ride of the top two lines is a trifle softer than that of the Ranger and Pacer.

The Edsel's gadgetry—mostly optional

CUSHIONS ARE SPLIT, one-third for driver, two-thirds for passengers in two-door hardtops.



FOR QUICK WARMUPS, coolant in 345-hp. engine circulates in stages—first in cylinder heads and around intake manifold, then in block, finally in radiator. Thermostats are set for 140 degrees F.



BRAKE SHOES automatically compensate for wear when pedal is depressed in backing up. Lever, triggered by cable and spring, rotates ratcheted adjusting screw.

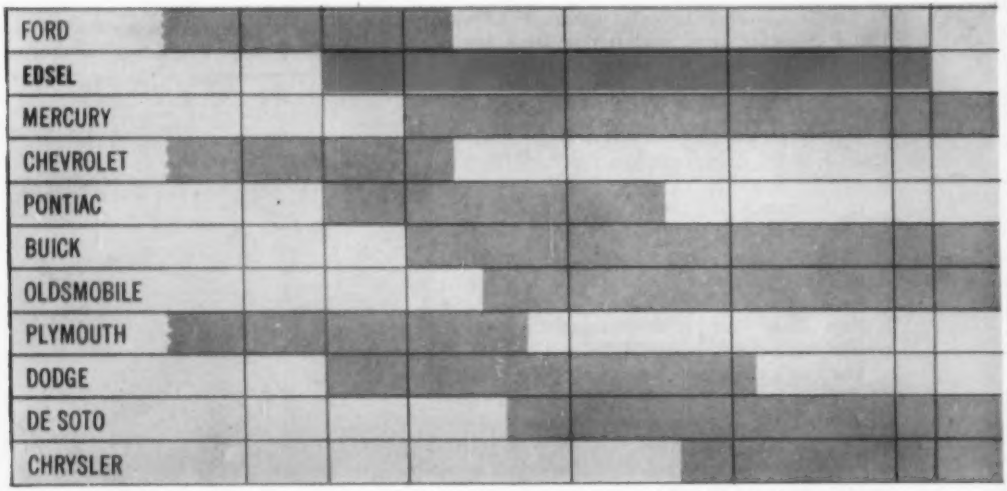
at extra cost—starts under the hood, where a warning is flashed to the instrument panel when the engine needs oil, and winds up at the deck lid, where a solenoid releases the lock at the turn of a key from the driver's seat.

The most prominent of the gadgets is the circle of pushbuttons in the center of the steering wheel to operate the automatic transmission. Two safety features: The transmission can't be shifted out of P-for-Park if the ignition is off, and it won't go into R-for-Reverse at a speed beyond that required for rocking the car in snow or mud.

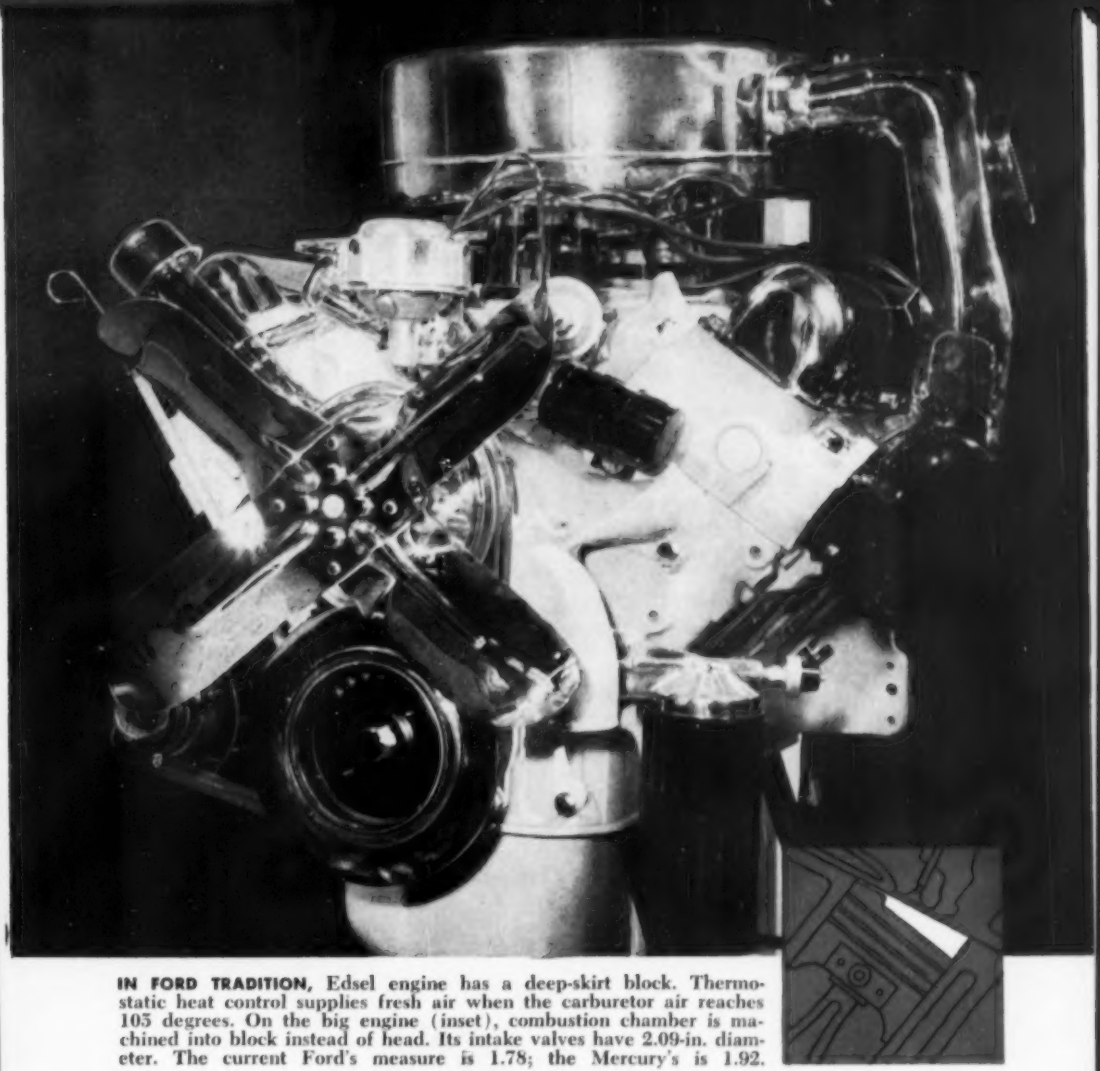
There's lots more. For fast warmups in cold weather, the circulation of water in the cooling system of the big engine is in three stages. It starts in the cylinder heads and through thermostatic valves spreads progressively to the block and the radiator as it warms.

The brakes automatically adjust themselves for wear.

Doors can be locked by remote control to keep moppets from falling overboard.



EDSEL PRICE RANGE (bright green bar) is designed to overlap cars at cheaper and more expensive extremes, blanket middle-priced cars. Other cars are represented by gray bars.



IN FORD TRADITION, Edsel engine has a deep-skirt block. Thermostatic heat control supplies fresh air when the carburetor air reaches 105 degrees. On the big engine (inset), combustion chamber is machined into block instead of head. Its intake valves have 2.09-in. diameter. The current Ford's measure is 1.78; the Mercury's is 1.92.

Heating, cooling and defrosting controls are combined on the knurled rim of a single panel dial. Just turn it.

A flasher light warns the driver when he is exceeding any speed that he presets on the speedometer.

There are louvered vents at the base of the windshield to direct incoming air up or down. On the panel there's a tachometer, an oil-pressure-is-low (in addition to a you-need-oil) light, a you-need-fuel light, a brake-is-on light, a door-is-open light, an engine-is-cold light and an engine-is-too-hot light. Naturally, all the old-hat stuff like power antennas and one-shot lubers are added to power brakes, power steering, power seats, power windows and automatic transmissions as additional options.

All this is the new Edsel—named for the late father of the three Ford boys, Henry, Benson and Billy—but it was on the styling that the company tycoons spent restless nights. It was decreed at the start that tail fins were out.

"We reached that decision fast," Dick Krafve, Edsel's general manager, told POPULAR SCIENCE. "We knew that by the time we got cars into showrooms, everybody in the industry would have fins. We had to be different."

[*Continued on page 282*]

How Disaster Strikes

Air crashes and tornadoes are up, railroad wrecks down, but auto disasters—though "minor"—still take the most lives

By Max Gunther

ON SEPTEMBER 8, 1900, exactly 57 years ago this month, a tropical hurricane churned northward into the Gulf of Mexico. With colossal fury it ripped into Galveston, Tex. Massive sea waves rolled inland, completely flooding Galveston Island. Some 5,000 people were killed. It was the worst disaster in U. S. history.

Disasters of that magnitude are rare. But each year in the U. S., there are roughly 100 disasters that take five or more lives apiece. There are usually at least four that cause 25 or more deaths each. And thus far in the 20th century, disasters killing 100 or more have occurred in two out of every three years.

There's no hard definition of a disaster. Insurance statisticians, generally speaking, call an incident a disaster if it takes

Old prints depict vividly great disasters of the past

THE GENERAL SLOCUM BURNS: More than 1,000 people died in the fire or drowned when flames broke out in the engine room of this crowded New York excursion boat on June 15, 1904.

CHICAGO FIRE: Supposedly started when Mrs. O'Leary's restless cow kicked over an oil lantern, the great fire of Oct. 8, 1871, took 300 lives and destroyed 17,000 buildings.

WORST DISASTER in U. S. history: On Sept. 8, 1900, a tropical hurricane struck Galveston, Tex., and a massive tidal wave inundated the city. More than 5,000 people were killed.

five or more lives. It's a "minor disaster" if it kills fewer than 25 people, a plain "disaster" if 25 to 99 die, and a "major disaster" if its toll is 100 or more.

Disasters are capricious. There's no way of telling when or where one will hit. Even so, like other random occurrences, disasters form long-range patterns and trends. By looking at these patterns, you can tell, in a general way, what kinds of disasters to expect.

By far the worst kind, in terms of killing and property-damage potential, is a hurricane. In No. 2 place among this century's disasters, under the Galveston storm, is another hurricane that blasted across Florida in 1928. It killed 1,836. The all-time property-damage record among U. S. disasters is held by a third hurricane. This is "Diane" of 1955, which destroyed about $1½ billion worth of property along the Atlantic Coast.

The second-worst kind of disaster is a fire. The most tragic fire in all U. S. history was one that surrounded, trapped, and killed 1,152 people in Peshtigo, Wisconsin, on October 8, 1871. On that same day, in Chicago, a restive cow supposedly kicked over a lighted oil lantern in a barn. The result was the famous Chicago fire, which took 300 lives and 17,000 buildings.

The worst fire of this century took place in the summer of 1904. The excursion boat General Slocum, jammed with people, was returning to New York City after a day's outing when a fire started in the engine room. Flames spread swiftly through the craft; and though the captain was able to run it ashore, more than 1,000 people drowned or died in the fire.

Another major fire disaster occurred in the fall of 1942, when flames licked up a set of wall decorations in a Boston night club, the Cocoanut Grove. The fire itself was not serious, but the resulting panic jammed people against the doors and kept firemen out. The toll: 492. Two years later, as 6,800 people watched a circus at Hartford, Conn., fire leaped up the big top and within 10 minutes brought the huge tent flaming to the ground. More than 150 lost their lives.

Taking third place: tornadoes. Though they're perhaps more terrifying than hurricanes because you can see their physical outlines, and though they pack winds of far greater power, tornadoes seldom spread damage over a large area. The worst tornado disaster of this century occurred in the spring of 1925 when a group of eight twisters mowed northeastward from Missouri to Ohio, killing 792.

Railroad and aircraft accidents rank fourth in disaster potential. So far in this century, only one train wreck and one airplane crackup in the U. S. have reached major-disaster proportions. The train wreck occurred at Nashville, Tenn., in 1918; it killed 101. The plane crash happened last year when two airliners collided over the Grand Canyon and plunged 128 to their deaths.

Fifth in this grim ranking are motor-vehicle accidents. At no time has any auto or bus accident in the U. S. taken as many as 100 lives. It's rare, in fact, that highway smashups take more than 25.

But when you consider the frequency with which each kind of disaster occurs, the ranking changes. Though motor-vehicle accidents are almost always "minor" disasters, they cause more deaths, added up, than any other kind of catastrophe. Over the past few years, minor highway disasters have occurred in the U. S. about once a week. On the other hand, there has never been a year in recorded history when more than four hurricanes hit.

In a survey by the Metropolitan Life Insurance Company of all disasters that occurred from 1951 to 1955, auto accidents headed the list. Next in order came those from weather, fires, aircraft crackups, and train wrecks.

This isn't the same picture that held a decade earlier, and it won't be the picture 10 years hence. Important long-range changes are foreseen.

Despite the devastation of Hurricane Audrey, which just this summer smashed the town of Cameron, La., with a loss of several hundred lives, many meteorologists expect fewer hurricanes to hit the U. S. in the next decade or two. According to Keith Veigas, meteorologist of the Travelers Insurance Company Weather Research Center, the earth goes through constant heating and cooling cycles. We now seem to be heading into a 40- or 50-year cooling period. "As the Equator becomes relatively cool," says Veigas, "the westerly winds that bring hurricanes to North America will shift further south. Thus, what hurricanes do develop won't be as likely to drift this way."

Decreased sunspot activity also will

WOODBRIDGE, N. J., FEB. 6, 1951: Worst railroad wreck of recent times occurred when a commuters' train hurtled off a temporary wooden trestle—last stop for 81 passengers.

IN WAKE OF HURRICANE DIANE, in Aug., 1955, a raging torrent swept through Torrington, Conn. In northeast U. S., Diane cost 191 lives, almost a half-billion dollars in damage.

Major U.S. Disasters in the 20th Century

YEAR	DISASTER	DEATHS
1900	hurricane	5,000
	fire	326
1903	fire	602
	fire	170
1904	fire	1,030
1908	fire	175
	tornado	100
1909	hurricane	350
1911	fire	145
1915	hurricane	275
1917	tornado	101
	explosion	133
1918	fire	559
	railroad	101
1919	hurricane	284
1925	tornado	792
1926	hurricane	1,000
1928	hurricane	1,836
1930	fire	320
1932	tornado	268
1934	fire	125
1935	hurricane	376
1936	tornado	216
	tornado	203
1937	explosion	294
1938	hurricane	600
1940	fire	207
1942	fire	492
1944	explosion	322
	explosion	130
	fire	168
	tornado	150
1945	tornado	102
1946	fire	119
1947	explosion	570
	tornado	169
1952	tornado	208
1953	tornado	114
	tornado	116
1954	explosion	106
1955	hurricane	184
1956	air accident	128
1957	hurricane	500

Does not include military action, ships except when in U.S. ports, aircraft except when over U.S., or mine disasters. Since 1900, major mining disasters have accounted for a loss of 3,600 lives.

Sources: National Board of Fire Underwriters, Metropolitan Life Insurance Co., National Safety Council, U. S. Dept. of Commerce Weather Bureau, Information Please Almanac

keep down the total of hurricanes in the U.S., says one weather expert.

Not only that—when hurricanes do veer northward, we're likely to be warned more precisely of their coming. Meteorologists such as Veigas and Dr. Thomas Malone, director of the Travelers Weather Center, have been experimenting with electronic computers in short-range weather predictions. Dr. Malone is now ready to tell any U. S. town what the mathematical odds are that any one hurricane will drift that way. Thus forewarned, citizens may be able to stem disaster.

No one is ready to make predictions about tornadoes. Meteorologists have no complete history of tornadoes to work with, for they can easily occur in sparsely settled areas without being reported. In recent years, there has been a huge apparent increase in U. S. twisters. From 1916 to 1950, there was never a year in which as many as 300 were reported; last year, the count was 823. No one is sure whether this is a real increase or merely an increase in the number seen and reported—as population grows in tornado regions.

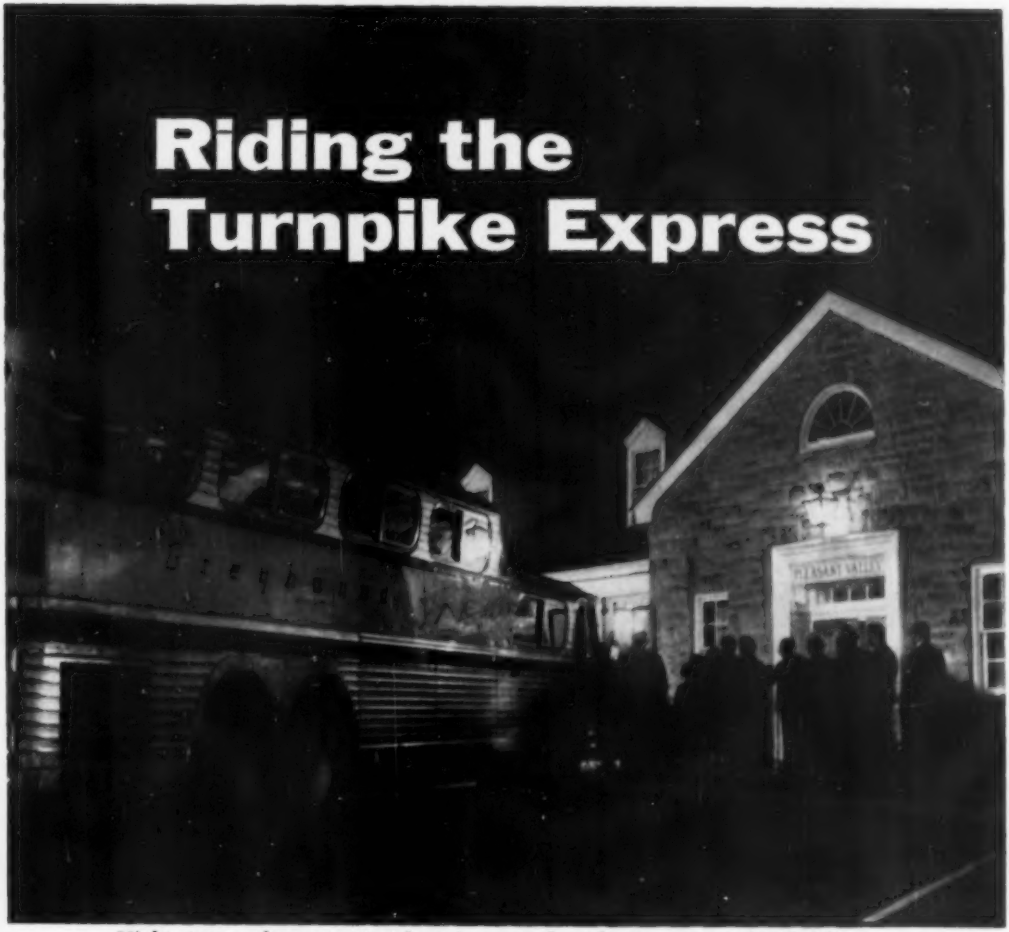
While hurricanes may become less common, fire disasters are on the rise. Losses set a record in 1956, and are currently running slightly higher. There were 430 large-loss fires ($250,000 damage and up) last year, against the previous record of 316 in 1955. John A. Neale, president of the National Fire Protection Association, points to the current urge of industry to build big plants in suburban and rural areas. "Not many small communities," he says, "have the facilities to handle a big industrial fire. This could mean more disasters and more large-loss fires."

There may also be an increase of fire disasters in old people's homes. Everett W. Fowler, Codes and Standards Director of the National Board of Fire Underwriters, points out that they're often substandard from a fire-protection point of view. They seldom earn much revenue, so the owners can't afford much more than old wood-frame houses. They're overcrowded. They lack modern fire devices. The second danger factor is the old folks' inability to move fast enough when fire does break out.

The very young and the old have always been fire's most likely victims. A 1952-1956 survey in Ohio showed that fires

[*Continued on page 284*]

Riding the Turnpike Express



Night stop—a chance to stretch, enjoy a snack and get acquainted with fellow passengers.

Hop aboard the Scenicruiser for the fastest through bus run in the U.S.—860 miles in 16 hours, 40 minutes

By Harry Walton

FOR something new in bus travel, come along with PS photographer Bill Morris and me on an express trip from New York to Chicago—the longest, fastest through run of its kind in the country. We'll ride linked toll roads across four states, without a traffic light or crossroad in the lot, and see how they wheel the big coaches on a schedule that beats all but the fastest trains.

We got aboard the big Scenicruiser at Greyhound's 50th Street terminal in New York. Bill and I rented pillows for the trip (30 cents each) and took front seats, which I was to regret later.

Driver James M. Tomb fired up the engines and started the air-conditioning. Watching passengers file aboard, I couldn't see how all those waiting could pack into the 43-seat coach. They didn't. A second section was announced for the surplus, and Tomb closed the door. The time: 5:45 p.m.

Buses are stacked in that loading line

A bus trip offers the traveler a chance to sit back and relax

LAST LOOK AT MANHATTAN is this panorama of skyline, glimpsed as the bus climbs a long ramp on emerging from the Lincoln Tunnel.

DRIVER'S VIEW: At his right is the faithful Tachograph.

like sardines in a can. It's no place for butter-fingered steering. But Tomb backed his coach out with the nonchalance of the 24-year, million-mile veteran he is.

As we waited for a light at Ninth Avenue, Tomb announced over the speaker that our first rest stop would be Mechanicsburg, Pa., at 9:46—four hours away.

Minutes later the bus plunged into the white-tiled bore of the Lincoln Tunnel, swept by numerous cars and trucks in the slow lane, and by 5:57 was climbing the long ramp on the Jersey side.

Except for the hiss of the air conditioning, it was quiet aboard. The closed windows shut out traffic noises; from my front seat I hardly heard the twin diesels in back. The big upper-deck windshield gave a fine view of the road ahead.

Traffic sorted itself out among Jersey's many arteries. Tomb headed for the Turnpike, paused at the toll gate, shifted up through gear changes and notched back the diesels to cruising speed.

Letting Bill take my place so he could shoot pictures through the top windshield, I descended the narrow steps and saw that we were rolling faster than it looked from above. The speedometer, housed with a clock in a squarish case, read 60. A bull's-eye glowed redly in one corner.

We closed up on a truck; Tomb checked his rear-view mirror, signaled to pass, and went by. He checked the right-side mirror, signaled again before pulling back to the right.

"They tell me these buses are governor-controlled at 60," I said. "So how come they pass me when *I'm* doing that?"

"***Tail wind,***" he said, grinning. "Sure they're governed, but you may get one set a hair over the limit. Given a light load or a downgrade, it might roll six or seven miles faster." He paused to pass a trailer truck. "Doesn't pay us to speed, though—got to pay our own tickets. We don't get blamed for running late. But the driver who arrives early, or makes up too much lost time, gets called on the carpet."

A car in the left lane forced Tomb to cut speed. He sounded the horn; the car stayed there. "One thing I won't do is pass on the right," he said. Eventually the car pulled over.

At Interchange No. 6 Tomb turned off onto the connecting link between the New Jersey and Pennsylvania Turnpikes. We made the toll stop, crossed the high-flung Delaware River Bridge, and rolled into the Keystone State. At dusk we passed historic Valley Forge. Tomb held the big coach right at 60. Night fell. At one point the glare of steel furnaces painted the sky. Some passengers dozed. One

while somebody else watches the lights and tackles the traffic

It records speed and time, flashes its red light at 60.

CLEANING TOP-DECK WINDSHIELDS during the run isn't usually part of the service. We had it done to make sure we'd get good photos.

of them held a portable radio to his ear.

We arrived early at the Mechanicsburg stop, chiefly because, being full up, we'd skipped a second loading stop in New York. "You get the extra time here," said Tomb. "Thirty minutes instead of 15."

Almost everybody got off to stretch or get a snack at the restaurant. Bill shot some night pictures while Tomb checked in with his relief driver, W. R. Kolbe.

Kolbe counted noses as passengers got aboard the bus again. (Wayward passengers are sometimes left behind at city stops, but rarely on turnpikes.) With everybody accounted for, he swung back onto the road.

The Pennsy Pike bores through the Appalachians via tunnels bearing such fascinating names as Tuscarora Mountain and Sideling Hill. At the latter, traffic was single-laned because the tunnel was being washed down. Roof lights flashed past in rapid-fire sequence, a hose splashed the bus briefly, and we emerged past a string of waiting Fruehaufs and a forlorn autoist changing a tire.

I reflected comfortably that any tires changed this trip would be no worry of

When you go by bus . . .

- Wear comfortable shoes—the casual slip-on kind if you have them.
- Take a thermos bottle to soothe thirsty children between stops. Remember to fill it at restaurants; water in the bus washroom isn't for drinking.
- Front seats are fine for kibitzing the driver, but check their leg space and footrests beforehand if you intend to stretch out and nap.
- Rent a pillow. It supplements the headrest, increases your chances of sleeping comfortably.
- Watch your step on the stairway of double-deck buses. Grip the handrail. Don't stand, or let children stand, near the steps. A sudden application of the brake could throw you down them.
- Plan on the big meal of the day before you get on, or after your arrival. Meal stops are fine for snacks but too short for a full-course dinner.
- Think about taking a sleep mask if you find it hard to doze by daylight. You may want to sleep while the sun shines.
- Check heavy luggage through. Pack shaving and other toilet articles, reading matter, toys and games for the tots, and other trip incidentals in a bag small enough to keep near you in the seat rack.

Through the king-size windows of the mile-a-minute two-deckers,

ROLLING THROUGH APPALACHIANS, you ride through seven tunnels on Pennsy Pike. But dips into darkness are followed by scenes like this.

GOOD SAMARITAN of the highway is the courtesy car,

mine (they weigh 300 pounds apiece). The coach lights were off now. Though there are individually controlled spotlights for stay-awake readers, most passengers seemed to be asleep.

Truckers waved us past by dimming their lights. A timid motorist crawled up from behind, hung back in the left lane, his headlights glaring in the rear-view mirror, then inched by. Hardly 10 feet ahead he began to pull back into the right lane. Kolbe had to touch the air brakes; our speed dropped to 55.

"We don't care how many go by us," he told me wryly, "so long as they keep going. This guy I may have to pass again."

But as if emboldened by his success, the driver sped up and disappeared. The 60-mile signal flashed on again. Our headlights swallowed up mile after mile as Kolbe steered around the turns with enviable precision.

"How do you drivers fight highway fatigue on these turnpike runs?" I asked.

"First of all by getting enough sleep," he said. "That's a rule. My own dodge is not to stare ahead all the time. I glance from side to side just enough to break the monotony."

The pike's gentle grades slowed trucks down, but we swept by as Kolbe touched a button on the stick. This down-shifts a two-speed planetary gear, giving a lower third-gear ratio. The change is as smooth as the kickdown with overdrive or an automatic box.

A buzzer sounded, but Kolbe ignored it. Soon a young fellow emerged sheepishly from the washroom. "I always give them one buzz to be sure," said Kolbe, explaining that many passengers mistake the plainly marked emergency button inside for a flush control.

You get all kinds of passengers, Kolbe reported. Westbound trips like this one often carry European visitors. (I found later that on board were an English family of five, just off the boat and en route to California; a Danish couple here to see relatives in Oregon, two English tourists, and an elderly Dutch couple going to visit their son in Calgary.) At the beginning and end of school terms, students and teachers travel by the thousands.

"We carry more women than men," a terminal official had told me. "They have more leisure time to travel, and they like to ride a bus." A Los Angeles woman on our trip said she had visited relatives in New York once a year for nine years—always by bus.

Our second stop was at 12:59; the place, a restaurant, still on the Pennsy Pike. A few sleeping children stayed on board. Wondering whether the luggage

whose driver helps motorists besides keeping tab on buses.

ENTERING CHICAGO, passengers take in the big-city skyline. Flat area just ahead of the windshield is the roof of lower bus deck.

in our seat racks was safe, I was told there is little trouble with theft.

We had soft drinks, stretched our legs, and 15 minutes later were herded aboard again. Trying to sleep in my upper-deck seat, I found the gentle, random rocking of the coach on its air springs more restful than the click of railroad wheels. But leg room in that front seat was too short. Eventually I squirmed into a barely tolerable position and dozed.

The loudspeaker woke me as Kolbe announced a 15-minute stop. (Most people, the company thinks, want stops announced even in the early-morning hours.) It was four a.m. We were on the Ohio turnpike, 500 miles from New York. Two thirds of us got off, groggily. Even now the restaurant, at the Great Lakes service plaza south of Cleveland, was crowded with hard-driving autoists.

Our third driver, T. W. Moore, had the longest run of the three—344 miles into Chicago. Drivers are paid on a mileage basis—about nine cents a mile, plus pay for ferrying a bus to or from its division garage. Turnpike runs may swell a driver's pay to $600 a month.

Conning Bill Morris into a swap of seats, I got more leg room and fell sound asleep until Moore announced our breakfast stop. It was 6:33 New York time. We tumbled out at Oak Opening service plaza and yawned ourselves awake.

With only 30 minutes to eat, few men passengers elected to shave in the restaurant washroom. (The one on the bus has no hot water for lather shaving, but does sport a 110-volt shaver socket.)

Bill and I settled for eggs and coffee. The English children, chattering like characters in a Late Show film, joyously discovered flapjacks. I set my watch back an hour to Central time.

After Moore had rounded us up and

[*Continued on page 285*]

More turnpike express runs are coming

As THE Federal highway program opens more super-roads, express-bus nets will spread. A Greyhound through run links Kansas City and Abilene, Tex., over two turnpikes. Trailways matches train time, Los Angeles-San Francisco, and has extra-fare luxury service: hostesses, German-built coaches, free snacks, music. You can take such other through trips, too, as Kansas City-Oklahoma City, San Diego-El Paso, Dallas-Shreveport, Memphis-Birmingham. And there's a coast-to-coast through run, New York-Los Angeles.

How Your Youngster Can Choose Both a Job and School

Industry is filling an urgent need for trained employees by financing their education—with full pay, on company time

By Vance Packard

YOUR youngster needs advanced, specialized training to get ahead these days. But maybe he has to go to work and support himself. Did you know that he can do both at the same time?

I uncovered this astounding fact during recent weeks while consulting many dozen companies. I found that firms all across America are paying young men and women good wages *while educating them at company expense.* They are spending tens of millions of dollars each year just to send employees to school, to learn to be everything from salesmen to doctors of philosophy.

This is simply good business. American industry needs more skills and brainpower than it can find ready-to-use. So hundreds of firms have gone into education on a large scale. A few have even set up their own campuses with fully accredited, degree-granting colleges.

Promising young men and women are now *invited* by some companies to come onto the payroll with the specific understanding that they will receive higher education at little or no expense to them. One such firm is the giant General Electric Co. Let's see how its "engineering apprentice" program works.

Suppose your son is accepted as an engineering apprentice at GE's great transformer plant in Pittsfield, Mass. He will go onto the payroll right away, full-time. Also right away, he and about 30 other young men will start a training program that will last four years. He will rotate work assignments in the machine shop, drafting room and engineering office. In addition, for nine hours each week—evenings and Saturday mornings—he will attend classes taught by instructors from the University of Massachusetts. Here are the courses:

First year: chemistry, math, English, inorganic chemistry, analytic geometry, public speaking.

Second year: calculus, physics, English.

Third year: physics, European history, advanced calculus, electrical engineering.

Fourth year: statics, electrical engineering, DC machinery, economics.

At the end of the four-year program he will be graduated as an engineering technician with two years of college credit. And he will have gotten a raise in pay about every six months. If he wants to go on to earn his degree as an engineer, the company will still underwrite him. It will pay all costs for night classes at nearby colleges. The company may even give him time off with pay—as much as four hours a week—to study.

How much money is spent on him? In effect, the company assumes virtually the entire cost of an engineering degree. If the student-employee wishes to speed up

Some companies operate their own schools to teach

his education by studying full-time, the company may lend him up to $1,000 . . . give him a leave of absence . . . and perhaps grant him a scholarship. And if he wants to study beyond his bachelor's degree (for his master's or doctor's degree) the company may offer a leave of absence plus a living allowance of $1,750 to $3,500 a year!

GE also runs similar programs to develop draftsmen, toolmakers, electricians, and, at the college level, engineers. To join one of these groups, a candidate must have finished high school in the upper half of the class. His record should show he has a knack for math and science. Finally, the most promising applicants take a 3½-hour test.

Such care in preselection for training pays off later for those who make it. GE boasts that more than half the graduates of its various apprentice programs have gone up the ladder to management positions: supervisors, managers, engineers, even vice presidents.

(For further information about GE programs, write the Apprentice Training Director of the plant nearest your home. Some of the larger ones are at Bridgeport, Conn.; Erie, Pa.; Evendale, Ohio; Fitchburg, Mass.; Fort Wayne, Ind.; Holland, Mich.; Philadelphia, Pa.; Rome, Ga.; Schenectady, N. Y.; Somersworth, N. H.; Syracuse, N. Y.; Waynesboro, Va.; and West Lynn, Mass.)

That's how one big corporation helps employees gain an education. What about others? Many different ideas are being tried out. In shopping around among them, it helps to know that most of the plans fall into one of these four categories:

1 Study on company time, at company expense, in company classrooms

You will find that most sizable companies today have large-scale job-training programs of this type. The manual of courses offered to employees of the Standard Oil Company of New Jersey is as thick as a mail-order catalogue. Some examples: a month-long course for industrial salesmen, another for refinery operators, another shorter course on "basics of supervision." Chrysler Corp. offers full-time courses (on company time) in 11 skilled trades: toolmaking, die-making, machine repair, die sinking, body-fixture building, electrical maintenance, pipefitting, tinsmithing, millwright work, die-model building, sheet-metal "experimental." The Metropolitan Life Insurance Co. will arrange, partly on company time, for one of its employees to become a professional actuary.

The most exciting on-the-job schooling I encountered is that conducted by General Dynamics, which makes atomic submarines, guided missiles and supersonic bombers. It has developed a vast program of instruction for the reason that many of its subjects are so out-of-this-world that most colleges don't yet teach them!

At the atomic-sub plant in Groton, Conn., for example, the company developed a course in "elementary nuclear physics" to help employees understand what they were doing. The company-prepared textbook has since been adopted by many U.S. schools. Seminars on astronautics are held for employees at the missile plant in San Diego. Students learn about missile-control systems, space propellants—and even about problems of space flight itself.

As one official remarked to me: "These are things most universities haven't even dreamed of giving."

At its Fort Worth plant, General Dynamics is spending hundreds of thousands of dollars teaching employees everything from blueprint reading to new concepts of aerodynamics. For many of its courses it brings faculty members from Southern Methodist University right into the plant

Where to Find Out About Company-Paid Education

JUST helping your youngster get a job with a big corporation doesn't guarantee him a free education, of course. The kinds and amounts of school help vary from company to company. For detailed information on individual programs:

- Ask your high school's guidance counselor about activities of local firms.
- Find out what your own company is doing to further the schooling of employees and employees' children. You may be surprised.
- Write to the director of public relations

subjects so new that colleges don't yet offer them

—employees on the job can thus even earn university credit.

2 Study in spare time at company expense

Here you get the programs that put the emphasis on "education" more than "training." You'll find that many companies urge promising employees to study at night, at company expense, subjects not directly related to the job. They even offer testimonial dinners, cash bonuses, extra vacations and raises to employees who win scholastic honors. Some will rearrange work schedules to give the employee-student a better chance to study.

A few companies operate their own free evening schools for employees. Perhaps the most famous is the Chrysler Institute of Engineering in Detroit. Every Chrysler employee is welcome to attend classes, free. Those who do go mean business: Classes run from 6:30 to 9:30, Monday through Thursday. This institute is authorized to grant regular college diplomas in mechanical engineering. Credits earned are accepted by any engineering college in the U.S.

The institute also offers shorter technology curriculums, covering 25 semester hours of standard college work, which qualify employees as "technicians." Certificates are awarded in general technology, chemistry, metallurgy, plastics and rubber, electricity, mechanics, mechanical drafting, and body drafting and design.

Another company that runs its own evening schools is the Crown Zellerbach Paper Co. in Camas, Wash. It has 12 faculty members, any employee can attend, and books and tuition are free.

The trend today, however, is toward underwriting the night courses that employees take at a nearby college or from a correspondence school. (More than 5,000 companies have formal arrangements with one correspondence school alone.) These underwriting programs go by various names: off-the-job education, employee study plan, self-improvement program. Most commonly they are called "tuition-aid plans."

New York University surveyed its night students and found that employees of 82 companies were having their tuition paid by their companies! RCA is spending upward of $170,000 a year to reimburse employees for completing college courses. The Southwestern Bell Telephone Co., which will contribute a maximum of $300 a year, reports that 1,800 of its employees are taking advantage of the plan to study math, business administration, public speaking, engineering and economics. An official of Standard Oil told me proudly that one of his employees had earned his B.A., M.A. and Ph.D. with company money.

Every company has its own regulations concerning these aid plans, but in general they work like this:

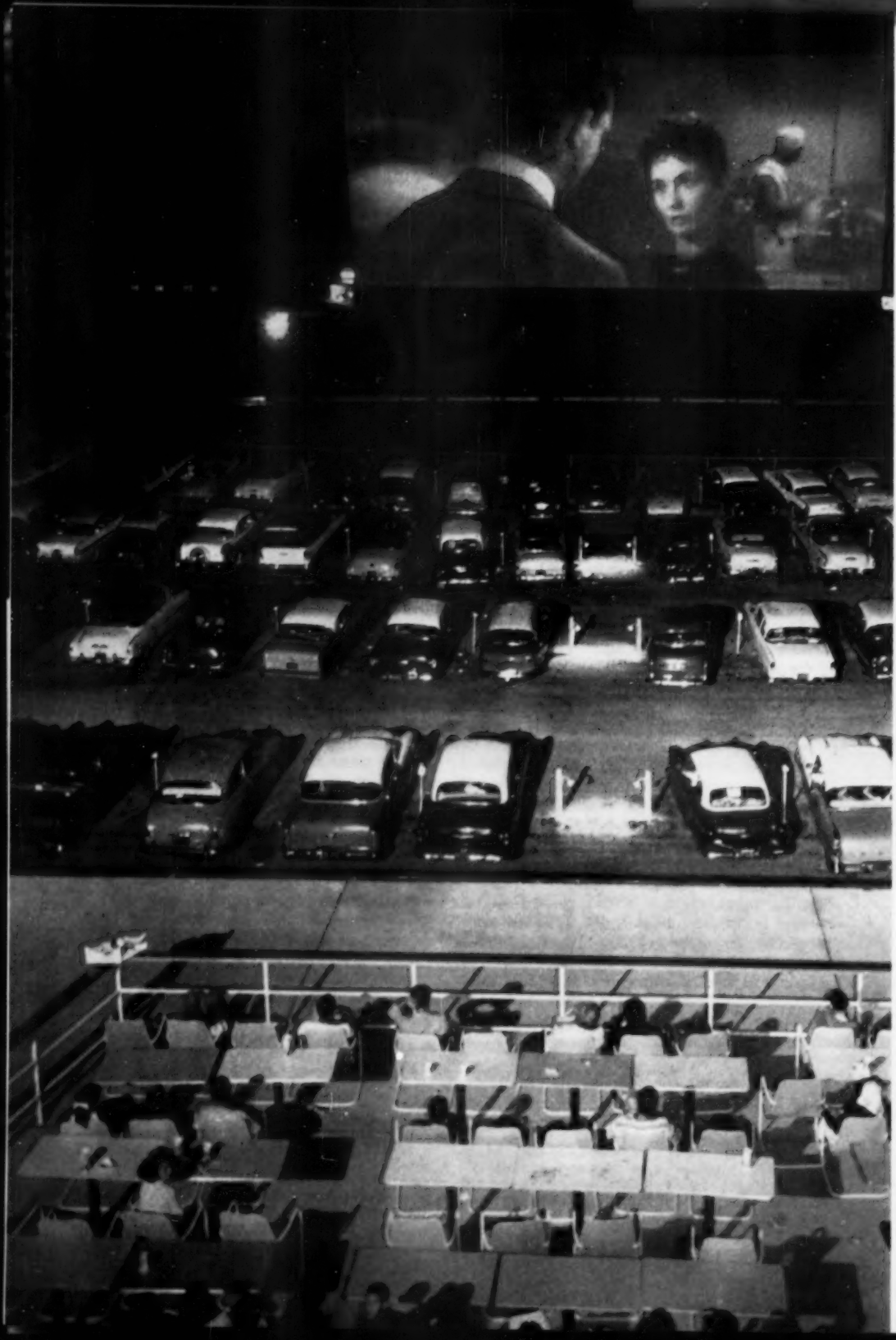
How much of the bill? Dozens of companies (such as RCA and the Chase Manhattan Bank) pay all tuition costs. Others pay a fraction. Some base the pay-off on grades. One leading firm pays 100 percent if the student-employee gets an A, 75 percent if he gets a B, 50 percent if he gets a C, and nothing if he gets less than C. While some firms help only with tuition, others cover all schooling costs, including supper money, textbooks, lab fees, even baby sitters. Socony Mobil pays half the tab for the diploma itself.

What can be studied? Most companies want your youngster's courses to benefit both him and the company. Esso puts it this way: The course "must have some bearing on the employee's performance of either his present job or a position to which he is likely to be assigned in the future." But an official told me, "In practice, we are very, very generous." Some

[*Continued on page 286*]

of any company you are interested in. Ask for leaflets the company has prepared on its educational policies. (If you can't find the address in the phone book, check the industrial directories in your public library.)

- Check with your friends about the aid-for-education plans being offered by companies they work for.
- Consult reference books such as *You Can Win a Scholarship* ($2.98, Barron's Educational Series, 343 Great Neck Rd., Great Neck, N. Y.), which includes a section on company-sponsored scholarships.
- Inquire at colleges that sound good to you and your youngster about industrial scholarships or co-op plans there.



Million-Dollar Drive-In Offers Films, Fun and Food

SPRAWLED over 28 acres in Copiague, New York, the 2,500-car All-Weather Drive-In Theater is one of the country's biggest. But aside from its magnitude, this suburban movie mecca offers its patrons many unusual features: an amusement park and playground for the kids; a cafeteria where you can fill up on hot dogs, pizzas or a real meal; an air-conditioned indoor theater for rainy evenings; even a trackless train to transport the cash customers from one attraction to another. Fun starts at one p.m.

The All-Weather Theater reflects the phenomenal growth of outdoor movies since World War II. In 1946 there were 300; now there are 6,000 catering to a weekly audience of 35,000,000. Drive-in operators attribute it to the mass move to Suburbia, more autos, and a shortage of baby sitters.

PS PHOTOS BY W. W. MORRIS

SKY-TOP RESTAURANT on roof of indoor theater (left) serves full dinners. The family above enjoys a snack on the patio outside the cafeteria. Both spots offer an unobstructed view of the movie screen.

ADMISSIONS GATE, like a highway toll booth, automatically registers each car as it passes through. Figures on "tote board" indicate the number of paying customers in each auto.

CAR SPEAKER with individually adjustable controls appeals strongly to a trio of tune-it-yourselfers. Wide range in volume of the speakers is a special boon to the hard-of-hearing.

TALLY-HO TRAIN provides quick transport from parking lot to movies and all other areas. During the 18-minute break between pictures, kids hop aboard for a free ride to the playground.

RAINY OR CHILLY EVENINGS? It's business as usual at the All-Weather Drive-In. The indoor theater (above) seats 1,200. This theater is open in good weather, too, for patrons who prefer to watch the movie in air-conditioned comfort. Films are presented simultaneously on both indoor and outdoor screens. The cafeteria is connected directly to the indoor theater.

NO BABY SITTERS need apply. These pajama-clad noisemakers have given up at last and gone to bed contentedly in the back seat, leaving Mom and Dad free to enjoy the picture in peace. END

Army's New Machine Gun Shoots from

YOU have seen the GI movie hero stalk boldly into battle firing a Browning machine gun from the hip—or even shoulder. That's Hollywood, and gets a laugh from any former service man who has ever lugged a machine gun around.

Now, however, the Army can really shoot from the shoulder, not with the Browning, but with a new lightweight weapon that has lopped from 10 to 20 pounds off the three .30-cal. machine guns it was developed to replace.

It is the "Caliber 7.62-mm.," a 23-pound, air-cooled, general-purpose machine gun. Its rate of fire (600 rounds a minute) is about the same as the heavier guns now in use, so that infantry gunners will still be able to get off short bursts.

This was an achievement: holding down the rate of fire while cutting gun weight almost in half. Hitherto, Ordnance

Heavyweight ancestors pose with the new one-man machine gun

Maxim of 1904 weighs 140 pounds; 1914 Hotchkiss (center), 110 pounds; new gun, 23.

the Shoulder

FIELD TESTS have proved that this light gun, officially designated T161E3, can outperform its heavier predecessors. Barrels are made of a new metal alloy that gives longer firing life.

experts at Aberdeen Proving Ground explain, light weight in experimental machine guns has been obtained by using a light recoil mechanism, which demands a high rate of fire. (A low rate of fire requires heavy recoil parts, defeating the purpose.) But with higher rates of fire, barrel whip impairs accuracy.

Weight reduction and low rate of fire were accomplished in the new gun by designing a new, lightweight gas-operating mechanism. In this system gas is bled from the barrel into a cylinder to operate a piston that works the firing mechanism. A hot barrel can be replaced in a few seconds.

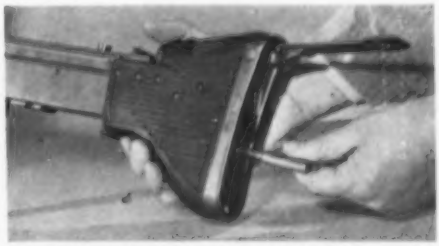
Recoil is less in the new gun. This is done by a spring-loaded buffer assembly in the butt that distributes the recoil over a greater period of time.

Another new feature is indicated in the weapon's designation: Caliber 7.62-mm. It refers to the ammunition, which is the NATO (North Atlantic Treaty Organization) 7.62-mm. cartridge. It is half an inch shorter than the standard U. S. .30-caliber cartridge.

FOR HIP SHOOTING, the gun is designed so that the gunner doesn't grip a hot barrel. It also can be fired from a tripod mount (not shown).

REPLACING THE BARREL takes mere seconds. Feed-mechanism cover is raised and the barrel is unlocked by pulling back the bolt, as above.

UNLOCKED BARREL pulls out. When removing a hot barrel under actual firing conditions, the machine gunner would wear special gloves.



A CARTRIDGE, used as a punch or lever, is the only tool needed to field-strip the weapon. Time for this: less than 10 minutes. END

The Most Difficult Rescue in Mining History

Trapped for 10 days almost half a mile beneath the earth's surface, two European miners survived a soul-searing ordeal

By J. D. Ratcliff

A FEW minutes before one p.m. on November 28, 1956, Günter Effenberger and Herbert Spiess walked aboard the crowded pit hoist of the Fröhliche-Morgensonne coal mine at Wattenscheid, seven miles from Essen in Germany's Ruhr Valley. They were totally unaware that they were about to become potentially legendary figures in mining—as subjects of the longest, most dramatic, and most technically difficult rescue in modern mining history.

Like a plummet, the hoist dropped into the inky blackness of the shaft, then stopped at Level 7. The two men got off, walked half a mile through the mine to another hoist, a 585-foot shaft connecting Levels 7 and 8. Here, they dropped down another 150 feet to the Waterfall seam, a working abandoned 20 years earlier but now being reopened. At this point they were nearly half a mile—2,200 feet to be exact—below the surface of the earth.

Until shortly after seven p.m. the day was like any other. The men cut coal from the seam with pneumatic drills of the type used in street-repair work, loaded it into cars. At five o'clock they had a snack meal of sandwiches and tea. A few minutes after seven o'clock they pushed two loaded cars aboard the hoist and then walked back to the face of the coal to resume work, a distance of 260 feet from the shaft.

They had barely taken up their positions when there was a deep, ominous, earth-shaking rumble. A rush of air followed, kicking up coal dust as it went. Then the drill went dead—the compressed-air pipeline had been broken.

In under a minute the two men were back at the shaft and saw what had happened. The entire shaft had caved in. Their only exit was blocked by hundreds of tons of rock—a mighty coffin lid sealing a tomb that might never be opened.

Effenberger, a friendly, smiling man of generally optimistic outlook, had been a miner long enough—nine of his 27 years—to know that life might depend on quick, clear thinking. Spiess, 38, was less experienced.

"We may be here a long time," said Effenberger. "If we want to stay alive we better get going."

Water and air were the first problems. Mine water was undrinkable, but there should still be water in the pipe used for wetting down the drill. Fearful that it would siphon off through a break in the collapsed shaft, Effenberger uncoupled the pipe. Then he stuck his head in a broken end of the ventilating duct, which had been severed by the cave-in. A few wisps of air were still coming through. If the shaft collapse had been caused by an

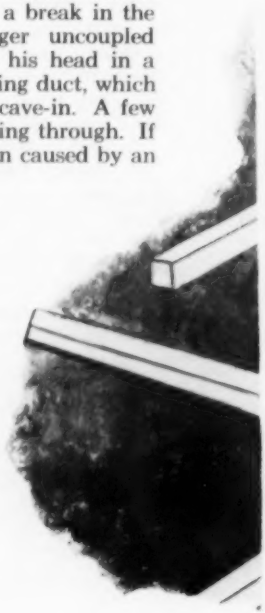
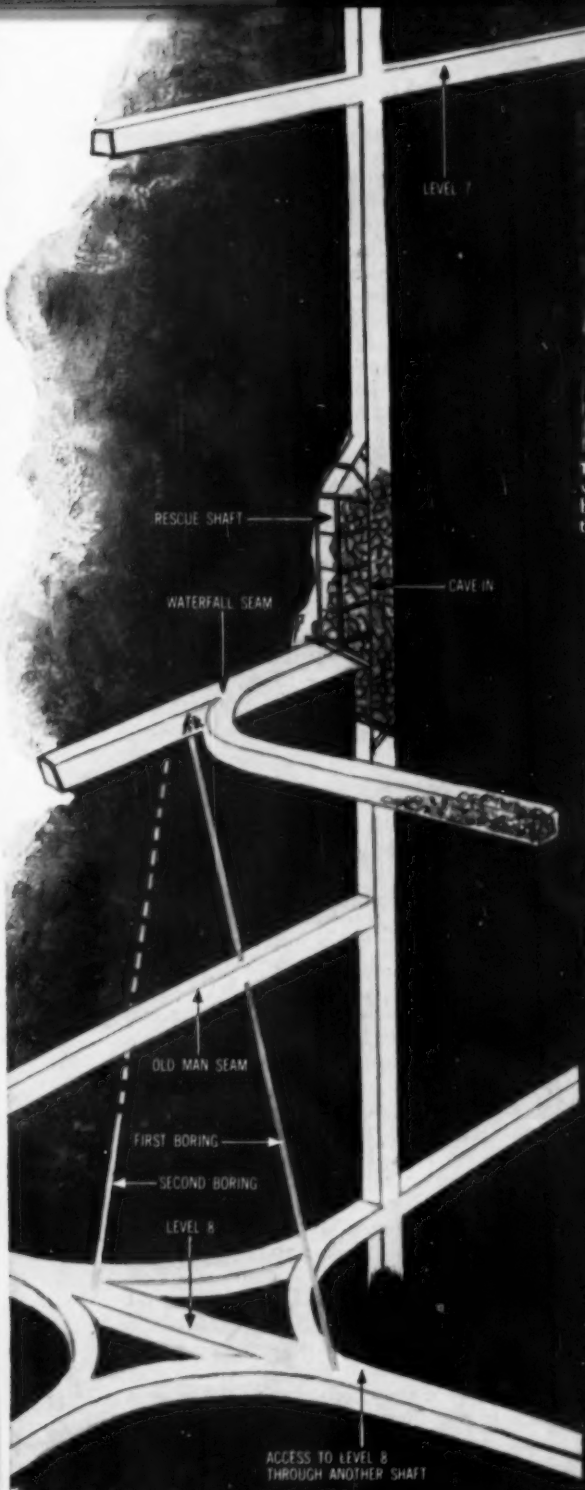


CHART at right shows the layout of the mine at Wattenscheid in Germany's Ruhr Valley, where Effenberger and Spiess were entombed during the longest rescue in mining history. They were trapped in the Waterfall seam, 2,200 feet below ground. Experienced mine-rescue men gave them little chance to come out alive. Finally, when rescue was minutes away, new tragedy struck which threatened to doom the effort.



TO PREVENT FURTHER CAVE-IN, the rescue shaft was boxed with heavy timbering. Big stones were broken up, loaded in iron buckets and passed up the shaft to men clinging precariously above.

ON THE SIXTH DAY, at three a.m., there was a crunching sound on the floor of their dank prison. Effenberger switched on his lamp. At their feet was the slowly rotating head of the drill!

CHEWING ITS WAY UPWARD through hard rock, the drill would have to traverse an abandoned gallery. Going through this empty space, would it deflect and never hit the small target area?

explosion, poisonous gases might soon become a threat—in which case the air duct might be a lifesaver. Effenberger and Spiess pulled together the broken ends of the rubber duct and wired them.

Batteries of their electric lamps were charged to give 14 hours of light. Seven of those had been used up. "We can get along without light," they decided. "From now on, we'll use it only when necessary." Lights were switched off and the two men sat down in the darkness to wait.

"They'll try to get us out," said Effenberger. But they both knew enough of the layout of the mine to realize that they were deeply trapped. They were in one of the worst possible spots for rescue.

Word of the cave-in was spreading rapidly through other sections of the mine. The hoistmen who had taken on the two loaded cars experienced an almost miraculous escape. They had stepped out of the shaft only seconds before its collapse. Miners and foremen sized up the extent of the disaster. They guessed correctly that the trapped men were probably working at the face of the coal when the cave-in occurred. Therefore they should be safe —at least for the moment.

A telephone call was put through to Dr. Wilhelm Mieles. He is managing director of the mine company, a division of the Rheinische Stahlwerke, one of the Ruhr's great combines of coal, iron and steel.

Mieles, 46, is a big, powerfully built, jut-jawed man. He comes from a family that has been in mining for nearly 200 years. It was 10:30 at night when he received the call, in a restaurant where he was entertaining a group of 20 mine doctors. He excused himself, hailed a passing motorist and asked to be taken to the pit head. There he donned mine clothes, rubber boots, a leather helmet—an outfit he was to wear for the next 55 hours. He started underground immediately.

At the time Mieles was receiving the telephone call in the restaurant, Ruth Spiess, wife of one of the trapped men, was sitting in the parlor of their apartment in the mine village, waiting for her husband to come home from the shift which she knew ended at eight o'clock. All miners' wives worry when their husbands are late from work, and Spiess was now an hour and a half overdue. She tried to solace herself with the thought that he might be working an extra shift—Christmas was near and, with three children, extra money would be needed.

Still, this seemed unlikely. The mine management didn't permit extra shifts unless there was emergency repair work to be done. When her worries became too much for her, she sought out her brother-in-law, Erich Scheinhard, also a miner, who lived nearby. Scheinhard knew of no accident, readily accepted the extra-shift suggestion. Why didn't Ruth go home and get some sleep? The night shift would be coming out at five a.m.

Immediately on going underground, Mieles examined the bottom of the caved-in shaft at Level 8. Then he went up to Level 7 to look at the top. Because of failure of the ventilating system in this portion of the mine, a thick, humid fog enveloped everything. It was impossible to peer down the shaft to judge the extent of the cave-in, to see how much shaft was left intact.

There was only one way to find out—to go down and see, at imminent risk of being buried alive by another collapse. It took until shortly after midnight to rig a steel bucket and winch. Mieles might have delegated someone else to the job. "But a manager has a moral responsibility," he says. So he climbed into the bucket.

Occasional rocks were still falling and echoing hollowly from the darkness below as Mieles was lowered away. At 130 feet he hit the top of the cave-in. Mieles shouted. If the trapped men answered it would indicate that their predicament wasn't too bad. But there was no reply. A quick survey indicated that rescue from this direction would be exceedingly difficult, maybe impossible.

Mieles set up headquarters for the rescue effort in the pit-head mine office. Draftsmen were routed out of bed and set to work making blown-up blueprints of the trap area. Professional mine-rescue teams were summoned to advise. Possible rescue tunnels were sketched on mine maps, and time to dig them calculated. One would take 75 days, another 30—both impossibly long unless the object was to recover

thing was to be alive"

BEARDED AND HAGGARD after their rescue, Herbert Spiess (near photo) and Günter Effenberger are brought back to the surface —and life. They had been buried alive for 238 hours. For days the two men subsisted on tea and water, made up games of checkers, fought numbness, sent signals, listened, prayed.

bodies for a funeral. Mieles wouldn't settle for this. "We are going to get them out," he said, "and we are going to get them out alive."

Drilling looked like the best answer. If you could drive a big enough hole into the trap area the men could at least be fed by this route while more elaborate rescue plans were devised. Such a rescue scheme had been used successfully on previous occasions. But in none of them was the distance as great as in the present one.

Although the trapped men were down a vertical distance of only 150 feet in the collapsed shaft, a much greater distance would have to be traversed by drill hole, since there was no entry directly above them. Drilling downward presented another problem. Enormous quantities of water would be needed to flush the drill hole. How to dispose of it?

All considered, the best approach appeared to be from below. Because of the sharp-angle pitch of the coal seams, the distance to be traversed from Level 8 was 351 feet.

In their dark prison Spiess and Effenberger tried to sleep, but sleep refused to come. Occasionally a lamp would be switched on to check the snail-like march of hours. On the wall of the mine, Effenberger chalked a rough calendar, so they could keep track of the passing days.

Spiess had a little tea left. They drank that. How long could they last without food? Effenberger *knew* he could last seven days—he had gone that long as a prisoner of the Czechs during the war.

To lighten the sleepless hours they devised a checker-like game, sketching a playing board on a plank and using lumps of coal as checkers. A meager amount of precious light was rationed for the game. But neither man was really interested.

When her husband hadn't arrived home by 5:30 a.m., Ruth Spiess started for the mine. There were a number of miners on the street, coming off shift. Yes, they said, there had been an accident. She went on to the mine office. There they tried to console her, persuaded her to go home and wait.

Most of the second day, November 29, was spent by the rescue team, now grown to 100 men, in dismantling and moving a five-ton drill into position on Level 8, below the trapped men. It had to be cemented into place with quick-setting concrete. The direction the bit was to take had been charted, but on its upward journey, chewing its way through hard rock, the drill would have to traverse an abandoned gallery—the Old Man seam. Going through empty space, would the drill deflect and never hit the small target area? The entry where the men were trapped was only nine feet wide. The answer wouldn't come for many hours.

At two a.m. on the third day, the drill, powered by compressed air, began to turn. By now Mieles was blank-faced with fatigue. Grimy, wet, he tackled another problem. If the drill got through, the men could be supplied and kept alive through the 5½-inch hole, but they would have to be gotten out the usual way, through a tunnel. At seven a.m., work started on a rescue shaft to be built around the cave-in area of the shaft Mieles had explored in the bucket. But first, the old shaft would have to be retimbered to make it safe. Bossing this dangerous job fell to 59-year-old Fritz Tiedemann, who had worked in

[*Continued on page 288*]

Your New Car's First Trip

EVERY working day of the year, 20,000 U. S. truck drivers hit the road with cargoes of automobiles. Their semitrailers tote from three to five cars apiece. Most of the cars are brand-new, on their way from factory to dealer. A single load can be worth $20,000—and up. The cars ride in and on a big, open-sided contraption that looks like a bridge on a hunt for a river.

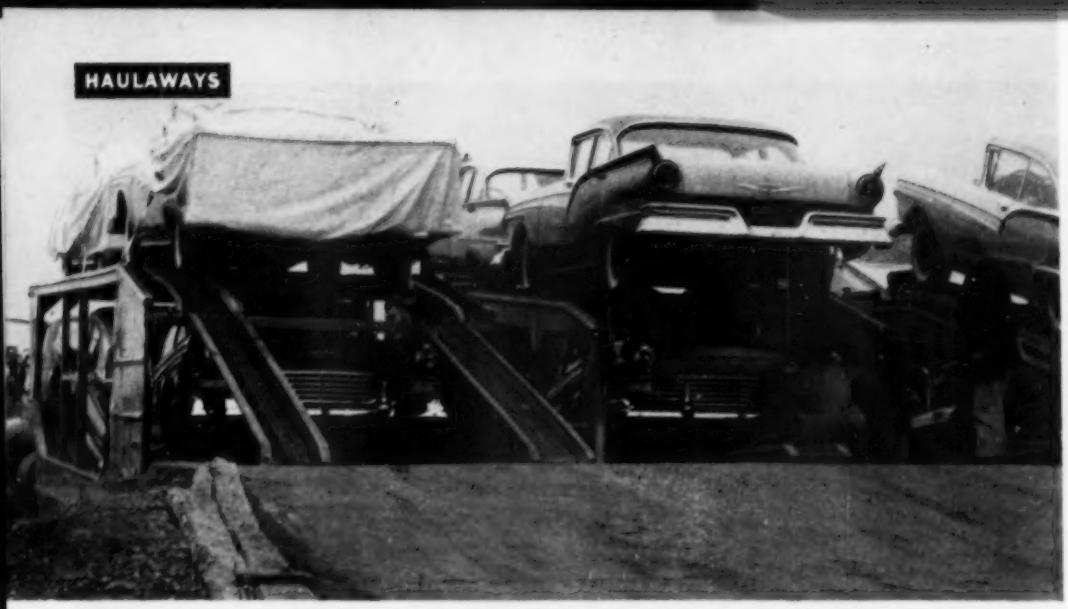
One of the most expert drivers of these "haulaways"—monsters weighing from 33,000 to 35,000 pounds—is Tom Broecker. He has driven 2,000,000 miles, and has delivered 20,000 cars, without an accident.

Tom has been at it for 24 years. He knows that a loose tarpaulin can rub ugly spot-glosses on a finish. He knows that if the snubbing chains are too tight, they can bend the roofs of the pillarless hardtops. He knows that fresh surfacing on a road may reduce the meager clearance for his rig at the next underpass.

Come along as Tom Broecker tells you in his own words about your car's first trip.—*Devon Francis.*

"I haul Fords from the factory in Dearborn, Mich. The first thing I've got to do is find my cars in the storage yard. They're tagged for destination. On this trip I'll have a split drop—one of the cars will go to Buffalo, two to two dealers in the Rochester area, one to Syracuse. The cars are convertible hardtops—the kind that really convert."

"I drive each car aboard myself. They have been 'shaken down' by Plant Protection to see that nothing extra is taken out of the yard. Wheel disks and floor mats are locked in the trunks to prevent theft. I have to get the cigarette lighters—the most easily stolen item—from a yard office. The cars on the bottom of the rig ride pitched—that lowers their roofs and keeps the overall height within the legal limit of 13½ feet."



"The ramps on top are hinged to allow loading below. Tarps cover the top cars only if

"The idea is to deliver the payload. Even when bad roads or weather hold me up, I still take plenty

"My rig, one of several hundred operated from Dearborn by the E & L Transport Co., is out-gated by a yard guard. With the 'horse,' or tractor, it weighs around 33,000 pounds. It's 45 feet long and eight wide. I've got 1,324 square inches of brake surface to stop with—more than five times as much as a passenger car. On the other hand my tractor engine, at 158 horsepower, needs a two-speed axle to get over the humps. With my four-speed box, I can get a reduction of 67:1 at my driving wheels. That costs gas, of course. I only get five to six miles to the gallon out of the 172 gallons I carry, less in headwinds. That's an estimate—my cab doesn't have a gas gauge."

there is danger from tree drippings, blowing sand, snow."

"I snug the cars down with toggle clamps. These have to be just so tight and no tighter. I recheck the load a little later on the road."

of time"

"The two-lane roads are bad—worse if they're covered with oil and rain—and the biggest hazard is the guy who makes a habit of cutting in and out. It used to be that I would signal with my lights to a car behind that it was safe to pass. But some drivers wouldn't understand, or would hesitate, and there could be an accident. My company has discouraged this practice for some time now."

"I never know when I'll be stopped by an inspector, from the Interstate Commerce Commission or Markel Service, a safety-engineering and insurance company. My log entries must not be more than two hours old. The ICC can fine me for falsifying my log or not keeping it up to date. I'm allowed 70 on-duty hours each eight days. Then I'm 'hot' until rested up. Company rules say I'm not to drive over 45 miles an hour. I don't—I have to pay my own speeding tickets."

"The top cars come first, on long skids. You

"Underpasses are a headache if the route is new to you. In case of doubt about clearance, you climb to the top of your rig and take a sighting. At times, I've had to unload the top deck to get through."

"It's dusk at my Syracuse drop. I've put in

have to brake carefully. It's hard work, but it pays well—I earn about $8,000 a year."

my 10 hours in one day under the ICC rules. Tomorrow I'll deadhead home." END

This back-yard observatory sets the style for stations where volunteers will track a silvery globe speeding

Amateur 'Moon Watchers' Get Set to Spot a Satellite

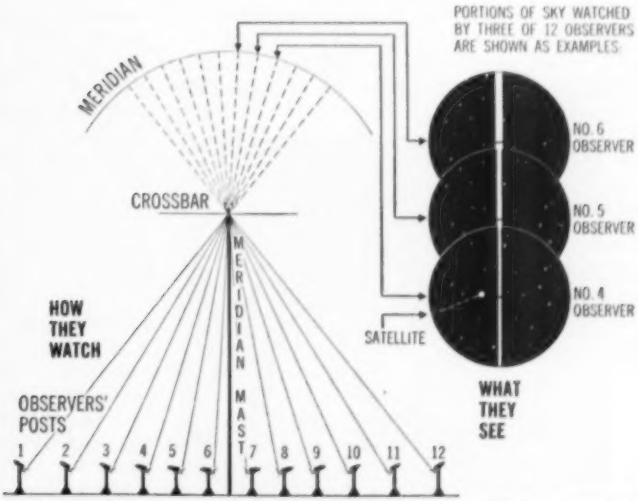
through space

SATELLITE SPOTTED! Simulating a sighting, observer Bob McCracken presses button below 'scope to register the time on a sound tape.

By Alden P. Armagnac

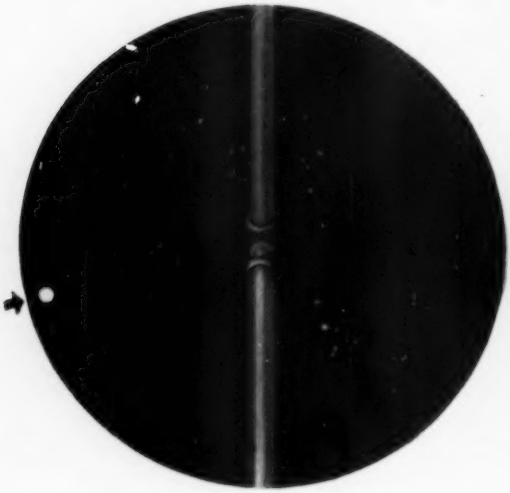
AMATEURS expect to be the first to see a man-made moon—and the last, before it plunges to a fiery end. At this writing, 1,400 of them have readied 84 "Project Moonwatch" observing stations, to help track the half-dozen earth satellites that the U. S. will attempt to launch before the end of 1958.

How they'll spot a satellite may be seen at the Moonwatch station set up by G. R. (Bob) Wright of Silver



"MOONWATCH" OBSERVERS of Wright's team man their posts at his Silver Spring, Md., station (left). Through 'scopes trained on top of mast, they watch long strip of sky (diagram). Wherever a "moon" crosses the strip, at least one observer should see it.

Lucky observer's reward will be this exciting spectacle as earth



"I GOT IT!" may be watcher's jubilant cry at first sight. Grammar isn't important; pushing timing button is.

"OUT!" he says, and taps button, as fast-moving satellite reaches the mast and vanishes behind it momentarily.

Spring, Md. A Weather Bureau expert by profession and an amateur astronomer by hobby, he heads the National Advisory Committee for Visual Satellite Observations. At his pioneer station, the country's first, he and his team have been trying out the instruments and procedure to be recommended to other groups.

What they'll all be looking for is a faint, moving pinpoint of light in the twilight sky—actually a silvery 20-inch globe, circling the earth 12 to 14 times daily at an altitude of 200 to 1,500 miles. It can be seen when it passes over an observer's area soon after sunset, or shortly before sunrise. At best it will be no brighter than a sixth-magnitude star, barely visible to the naked eye. It can be distinguished from the stars because it will be sailing rapidly across the sky, from west to east, seemingly about as fast as a high-flying airplane.

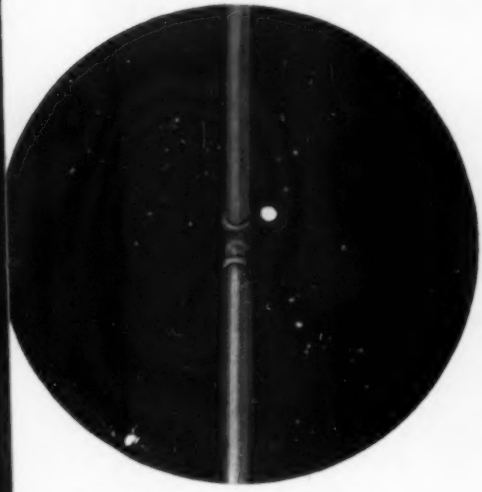
PLAYBACK of tape recording will yield data that Bob Wright (center), leader of Silver Spring group, will telephone to Cambridge to help scientists chart the path of an earth satellite.

Real first-class satellite watching isn't for a "lone wolf," Bob Wright explains. You might sit watching for the "moon" with the best of binoculars and never see it, if you weren't looking in just the right direction at the right moment.

What it takes to spot a newly launched satellite is an organized team, preferably a dozen members or more, each observer standing guard over a sector of sky assigned to him. Center of their activities is an outdoor observatory, patterned after the one Wright shows you in his backyard.

First thing you see there is a metal pole, topped by a crossbar, standing 30 feet high. Exactly north and south from this "meridian mast" extends a 52-foot-

satellite sails across field of view. Here's what he does about it:



"IN!" Button signals reappearance. Especially important to time: passage across meridian, marked by the mast.

"OUT OF THE FIELD!" Again, the button, as brief spectacle ends. These views exaggerate "moon's" brightness.

Star background: Yerkes Observatory photograph.

long row of wooden posts set into the ground. They serve as pedestals for a dozen observers' small telescopes. There's an inclined mirror at the front of each 'scope, so it can be used at a comfortable near-horizontal angle.

Seated in this "observing line," members of Wright's team adjust each 'scope by training it past the top of the meridian mast—which, with its crossbar, makes a vertical line bisecting the field of view. This done, they're collectively watching a long strip of the heavens along the celestial meridian. They hope a satellite can't cross this "optical fence" without being detected by at least one observer.

Their amateur-designed telescopes, which can be inexpensively homemade, now are favored over binoculars for Moonwatch teams. The instruments have a modest magnifying power of 5½ times. Their big advantage is their extra-wide field of 12 degrees. Thanks to this, as few as a dozen observers can cover a 90-degree sky strip, allowing generous overlap. And an observer gets precious additional seconds of time to detect a "moon" crossing his field of view.

Supremely important to observe, besides a satellite's "declination" or altitude in degrees as it crosses the meridian, is the precise time of the crossing. So a home-model tape recorder, set on a table beneath the mast, runs throughout the observing period of one to two hours. Beside it, a radio receiver is tuned to the time signals coming at one-second intervals from the National Bureau of Standards' station WWV. The tape simultaneously records the time signals, the observers' voices, and "beeps" from electric signal buttons—one of them within easy reach of each observer.

Take a typical evening observing session. Members of Bob Wright's team will assemble 15 minutes after sunset. They'll take their assigned places in the observing line, adjust 'scopes, sit and watch stars appear in the darkening sky.

Then, one of them may spot the electrifying sight—the moving, starlike satellite. What does he do and say?

He taps his time-registering signal button—and shouts something as informal, if he pleases, as "I got it!" Keeping an eye glued to his 'scope, he presses the button again when the "moon" disappears behind the meridian mast; when it reappears; and when it passes beyond the

[*Continued on page 291*]

'Engine of Tomorrow'

The chug-chugging free piston already powers ships and a locomotive, looks more promising for cars than the gas turbine. Cheap to make, it will run on almost anything that burns

By Harland Manchester

THE Ford Motor Company does not maintain a woodshed for lone-wolf inventors, but three years ago last February when Ford engineer Paul Klotsch wanted to build an engine he was brooding about, he found the next best thing—a neglected 10-by-15-foot shack at the Dearborn engineering center.

This engine was born in a shack

Klotsch, a gray-haired package of energy who once drove a plane in Baron Richthofen's Flying Circus in World War I, was steamed up about the free-piston engine. A cross between a diesel and a gas turbine, this hybrid had been installed in a number of French naval vessels, power plants and a locomotive.

"Mr. Free Piston" —Ford's Paul Klotsch—shows one piston of an engine developed from his pioneering work in an unheated shack at Dearborn

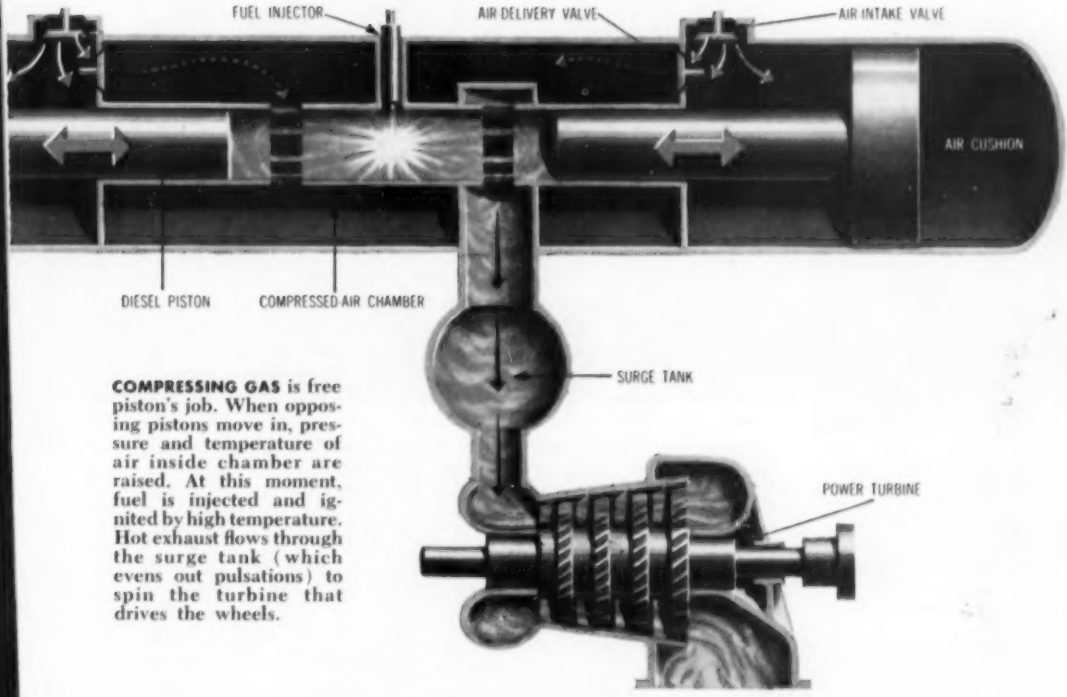
Klotsch had boundless conviction that the new engine had a big future in smaller sizes. Management was not much impressed, so in the true tradition of Henry I, Klotsch took over the unheated shack with three helpers. Wearing overcoats and earmuffs and working under a single light bulb that dimmed when they used power, they built the smallest free-piston motor that Klotsch could dream up. It was a 10-hp. job that operated according to plan, and Klotsch eagerly drew plans for other sizes.

Now Ford's hat is definitely in the free-piston ring, along with those of a dozen other corporations. Klotsch, manager of the mechanical department of the Ford Scientific Laboratory, has a large modern building full of the radical new engines in all shapes and sizes, and he is becoming known as "Mr. Free Piston."

An experimental free-piston engine rolled out last March in a farm tractor. It is called the Ford Typhoon. Considering it, without opening the hood, you'd see a neatly styled, 50-hp. beast that emits a sucking chug like an air compressor.

It thrives on any fuel: high-octane gasoline, diesel oil, kerosene, shale oil, butane gas or even peanut or other vegetable oils. In fuel consumption it matches the diesel, long

Goes to Work Today



COMPRESSING GAS is free piston's job. When opposing pistons move in, pressure and temperature of air inside chamber are raised. At this moment, fuel is injected and ignited by high temperature. Hot exhaust flows through the surge tank (which evens out pulsations) to spin the turbine that drives the wheels.

hailed for efficiency, and engineers are confident they can do better. It weighs somewhat less than a diesel and should cost less in mass production. It has virtually no vibration. And, most impressive of all for tractor use, it has superior torque at heavy load.

Ray J. Miller, General Engineering and Research Manager of the Ford Tractor and Implement Division, explains: "When you are plowing with today's reciprocating-engine tractor and you hit a tough spot, the engine slows down and you lose power at the wheels. If the going is tough enough you stall. With this engine, torque increases as the engine slows down, and the more you slow down, the harder it digs in to do the job."

When you open the hood, you see an engine like no other on earth. It has two basic parts: an opposed-piston diesel, called a "gasifier," which has no crankshaft or connecting rods, and a five-inch turbine, driven by the hot diesel exhaust. The horizontal diesel cylinder is shaped like a squared-off dumbbell and the pair of opposed free pistons can be likened to squared-off mushrooms whose stems face each other in the dumbbell grip. The pistons are forced together initially by a compressed-air starter, and fuel is injected into the super-

Free piston rides rails in France

Hardly an experiment, this locomotive has been speeding passengers from Paris to Cambrai in regular service since 1952

heated air between them. Driven apart by combustion, they bounce against cushions of trapped air at each end, and are driven together again to start another cycle.

The big outer ends of the pistons—the "mushroom caps"—do another job on the inward stroke. They force compressed air into a chamber around the cylinder. This blows through the cylinder when ports are cleared by the outgoing pistons, scavenging the gases and supplying pure air for the next combustion. Both gases and scavenging air are led to a "surge tank" that evens out the pulsations of the engine and delivers a continuous flow of gas to the turbine. In a straight diesel engine, the scavenging air is thrown away and its heat lost through the exhaust. This is one reason why Ford engineers believe the new engine may surpass even the diesel in fuel economy.

The mixed-in air does more than scavenge. When the gas hits the turbine blade, its temperature runs about 950° F. and this is important. It means that the turbine can be made of ordinary stainless steel, while the "pinwheel" for straight gas turbines requires expensive alloys to resist much higher temperatures. The "straight turbine" pinwheel currently costs about as much as an entire automobile piston engine, while Paul Klotsch figures that in orders of 60,000 Ford should be able to get its free-piston turbines for $18 each. Even if other things were equal, this might be the determining factor in any race between the two new power plants.

"This engine also solves the acceleration problem that bothers the gas turbine," said Ray Miller. "In the built-in fluid drive of the gas turbine there is an awkward time lag while the power turbine catches up with the compressor turbine. But the free piston, with its variable compression ratio, is so responsive that it accelerates even faster than a conventional gasoline engine. The free piston-turbine combination also has the equivalent of compression braking, for if you take your foot off the pedal and reduce gas pressure, you create a partial vacuum at the turbine and get a fast braking effect."

Free-piston engines now in use weigh much less than comparable diesels and somewhat more than gasoline engines, but Klotsch and Miller state that they are so amazingly adaptable that these comparisons have little meaning. The 50-hp. Typhoon engine will deliver 100 hp. with a few changes. "Broadly speaking," says Miller, "you could double the power of any free-piston engine by making the pistons lighter, perhaps using aluminum instead of cast iron, thus increasing the engine speed. This unique convertibility means that you could cover the entire range of automotive horsepower by means of variations on a standard-size engine.

"Another attractive feature is ease of maintenance. The

Ford tries out free-piston tractor

Strange cluster of dials (above) faces driver of experimental Ford Typhoon tractor. Big advantage of the chugging engine: It pulls hardest at slow speeds, when power is needed most

cylinders wear less because there are no connecting rods to impart side thrusts. There is only one injector, compared with one for each cylinder in the diesel. A complete overhaul takes only a fraction of the mechanic-hours needed for diesel or gasoline engines. No battery is needed for starting; when you kill the engine, compressed air is stored for the next start, so 'juice' is used only for lights and minor accessories.

"These are a few of the reasons why we think the free piston is a strong contender in farm equipment and in the whole diesel field. It may be years, however, before these tractors go on the market. We have a number of ideas for making the engine even better. As for the passenger car, we see no engineering reason why the free piston can't drive it, but the heavy-duty vehicle is our first goal."

GM keeps eye on road with free-piston car

Strictly dream stuff, the XP-500 has free pistons under the hood. But GM has already put bigger engine of same type in a ship, plans another for a locomotive

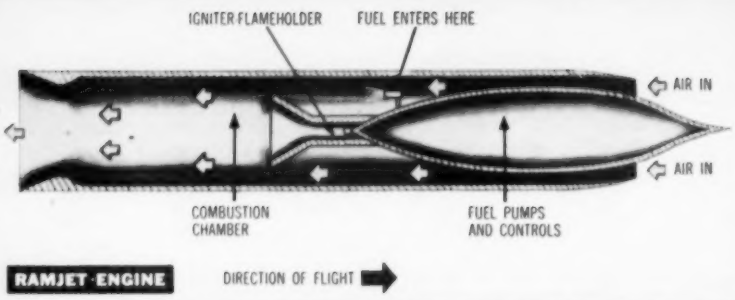
Meanwhile, General Motors, which last year put the free piston in a smartly behaving experimental passenger car, has gone to the other extreme. They've built a giant 6,000-hp. marine free-piston power plant, installed in the 9,000-ton Liberty ship William Patterson.

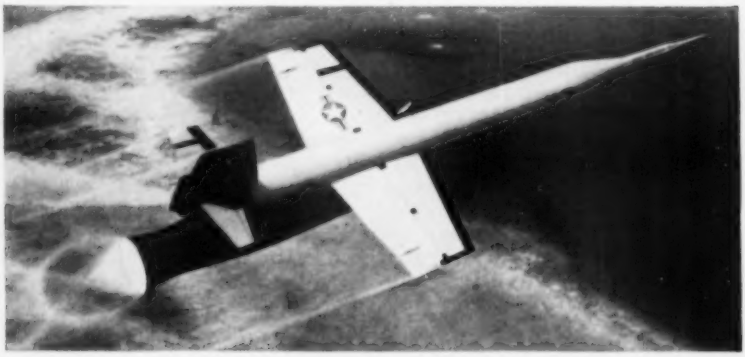
This power plant, designed with the aid of the French firm, SIGMA, has a battery of six free-piston diesels, or gasifiers, from which the gas is piped to two turbines that drive the propellers. The engine's versatility is shown in the reverse mechanism. A valve on the gas duct is opened to bypass the gas "around the corner" to a reverse turbine mounted on the same shaft. (The same ingenious method could be used if desired on automotive engines.) General Motors predicts that this power plant will be 20 percent more efficient than steam engines or gas turbines of the same size. Results of test cruises are expected by the first of the year.

"Many people seem to think this motor is still in the experimental stage," said A. F. Underwood, GM's Manager of Research Staff Activities. "Actually it has proved itself thoroughly, and is here to stay. At least a hundred are in daily operation in many countries, and a hundred more will be put to work before the end of the year. General Motors has tested free-piston engines for 30,000 hours, and we are convinced that they can furnish mechanical energy from liquid fuels at the lowest cost per horsepower of any engine.

"Years ago the Defense Department began looking for an 'omnivorous' engine that would lap up any fuel, and greatly simplify fuel-transport problems. This is the engine. If

[*Continued on page 294*]





Ramjet test missile takes off on supersonic flight

CARRYING a supersonic ramjet engine and a rocket-booster tail section, Lockheed's X-7 ramjet test missile is launched (right) from a B-29 over the test range at Holloman Air Development Center in New Mexico. In the inset it is shown in actual supersonic flight after dropping the booster tail. (Those are shock waves forming in the exhaust trail.)

Picture News
IN THE WORLD OF SCIENCE

Since ramjets have no compressor and depend for operation on ram compression of air by high forward speed, the booster is needed to bring it up to where the jet takes over. Cutaway shows how a ramjet works.

Both the X-7 and its tail section are recoverable by parachute. The test missile, controlled by ground radio, transmits performance data in flight. Smoke released from the B-29 simplifies optical tracking.

Blow-up cover for swimming pool lengthens season

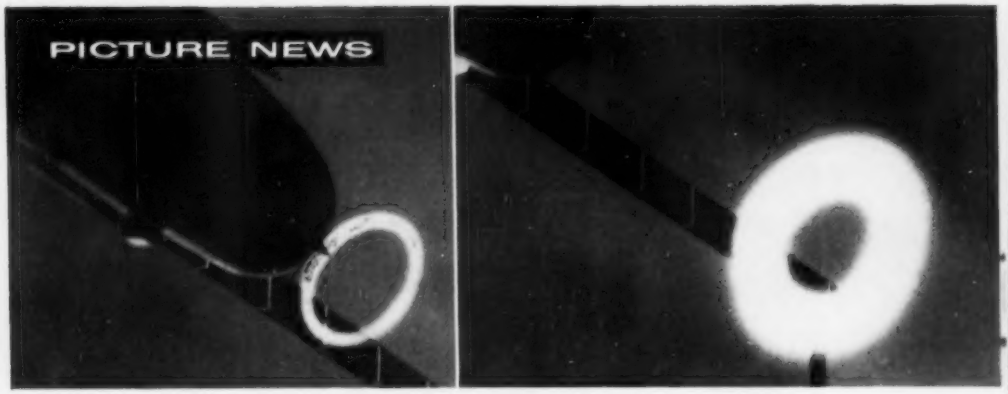
IN THE Buffalo, N. Y., area, where nippy temperatures come early in fall and stay late in spring, Walter Bird did something about the weather. He had his Birdair Structures, Inc., makers of air-supported buildings for radar and other uses, design a top for his swimming pool. The transparent plastic center admits sun, coated ends provide shade and privacy.

Multiple meters check costs of household appliances

A SEPARATE meter for each appliance-bearing circuit in his home gives Carl Kruempel, rural-electric manager at Independence, Iowa, a record of individual operating costs. Here's the breakdown for appliances used by his family of seven during the first year's check: television set (averaging six hours a day), $14.34; water heater, $81.69; furnace blower, $36.24; kitchen range, $37.65; refrigerator, $11.85; automatic washer, $6; dish washer, $11.52; and garbage disposer, 36 cents.

Rail-riding fork lift reaches into shelves 30 feet up

THIS West German fork lift, suspended from overhead rails, can move up and down to any shelf level, back and forth along the aisle, and to right or left, in reaching any storage space in the two 30-foot-high banks of racks it services. Its movements, including swiveling around the pole, are controlled by pushbuttons from the operator's cab.

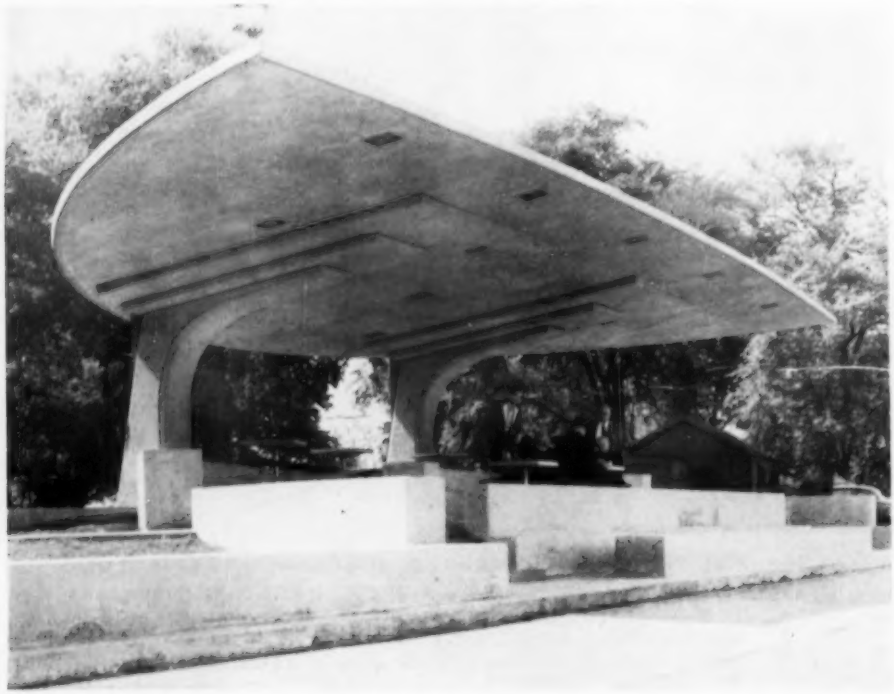


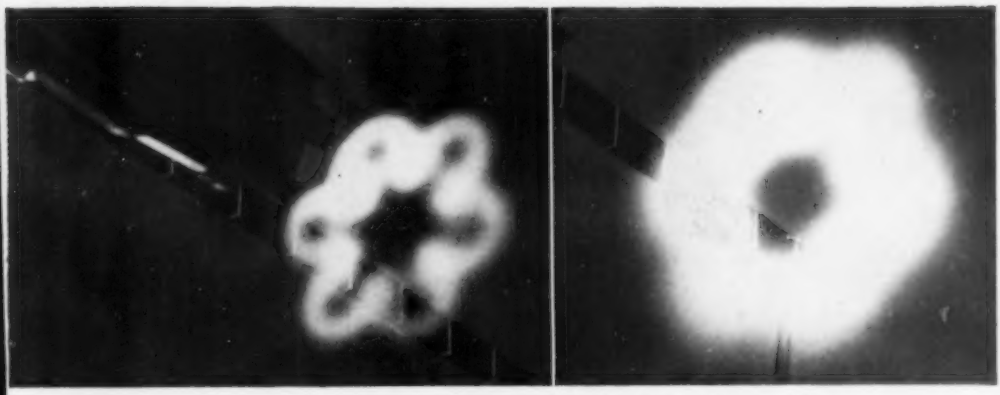
Jet smoke rings help engineers "see" noise

INTRODUCTION of smoke into the jet stream lets engineers at Douglas Aircraft *see* the noise a jet makes and test devices for suppressing it. The blast is made to smoke by mineral oil injected into the air supply, and illuminated by a thin slice of light passed through at any

Cantilever canopy shelters park pavilion

A GRACEFUL cantilever concrete slab adds a modernistic touch to a new pavilion in Chicago's Lincoln Park. The structure, which cost $90,000, was donated by a chess fan, Laurens Hammond, head of Hammond Organ Co. It has built-in chessboards for rain-or-shine play.





point downstream. Photographed at far left is the exhaust of a standard jet one diameter downstream, and next, only slightly diffused, four diameters away. Above is the stream at the same points after installation of a suppressor. Engine roar is caused by the turbulence created as the jet exhaust shears through relatively still air.

Fourth-graders win chance to "fly" in old Link trainer

PUPILS in Jean Bryant's class at Chelsea Park School in Seattle learn to pilot early. Miss Bryant (left) persuaded parents and the school board to buy an old ground trainer to spur interest in lessons. Only students who complete their work and file a flight plan can "fly" it.

Air hammer wears muffler in hospital quiet zone

THE loud *rat-tat-tat* of a pneumatic hammer breaking up pavement is said to be effectively deadened by this jacket. Instead of the rapid-fire racket of metal on metal, noise is confined to the relatively soft thud of steel digging into concrete. Thor Power Tool Co., of Aurora, Ill., designed the sound squelcher for its paving breakers and diggers.

He walks on water with his duck-hunting skis

IT TAKES a little practice, but Daniel Fournier of Hamilton, Ont., finds these water skis better than wading to retrieve a duck or fish in shallow water. He built them of aluminum. Each weighs 12 pounds, has a flap on the bottom for "grip" as he moves with a sliding technique.

Double-dump truck hauls two loads on same trip

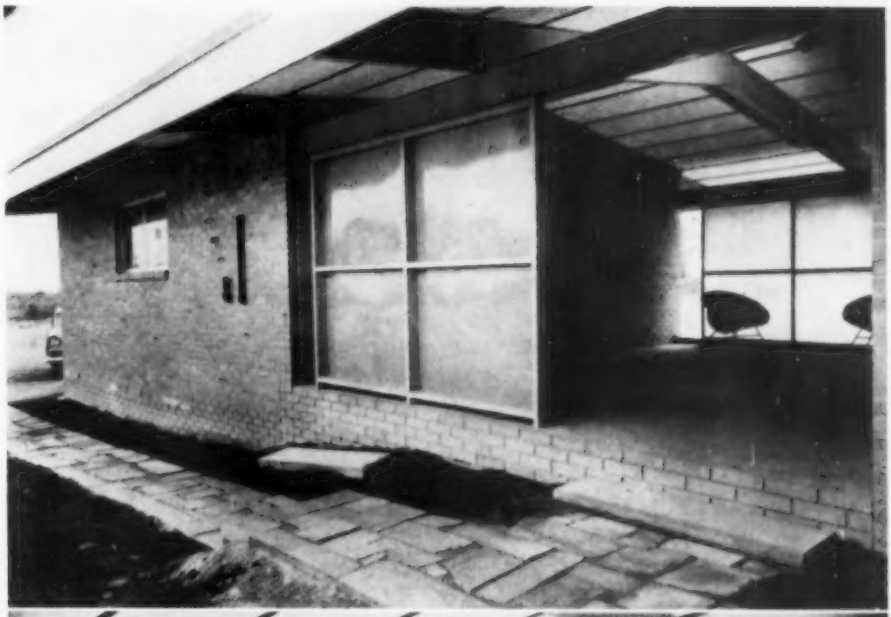
RIDING tandem over Utah roads, these light, aluminum dump bodies allow a double-load delivery of uranium ore per trip. On arrival, the driver dumps the rear unit by hydraulic lines from the cab; then jack-knifes the front one, and dumps it without running over either load.

Driverless 'dozer will tackle danger-zone jobs

WITH a radio receiver mounted in the driver's seat, this bulldozer can be driven by commands from a jeep or helicopter up to 15 miles away. Here Army engineers test it close up, guiding it by control buttons on a transmitter in the jeep. It's designed for construction work in radioactive and combat zones, and such jobs as fighting fuel fires.

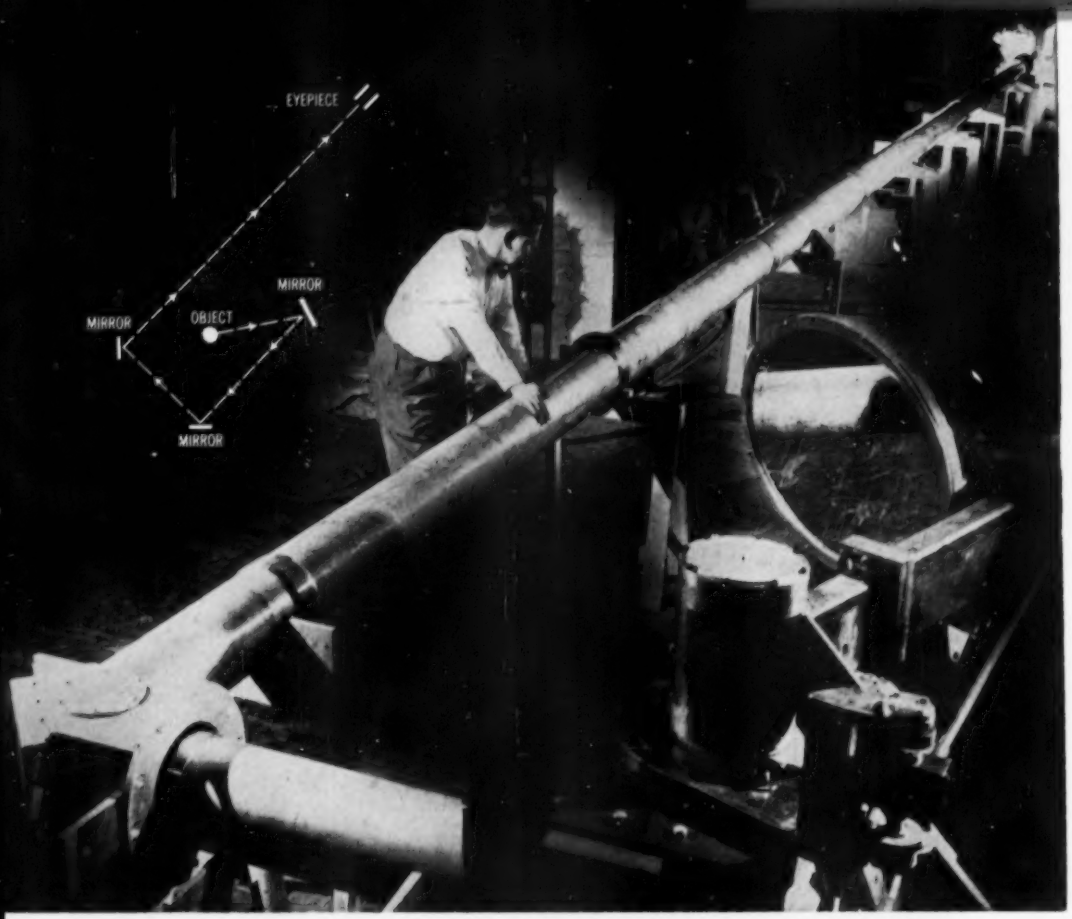
"Spot wobbling" may rid TV picture of scanning lines

BELOW are two close-ups of the same television picture tube. Dark scanning lines in the one at left are what you see when you sit too close; at right they have been eliminated by wobbling the beam vertically 15,000,000 times a second as it darts across the screen. Westinghouse research scientists accomplished this experimentally by splitting the picture tube's spot-focusing grid and plugging the tube into a socket with a device to wobble voltage. Possible result: bigger picture tubes.



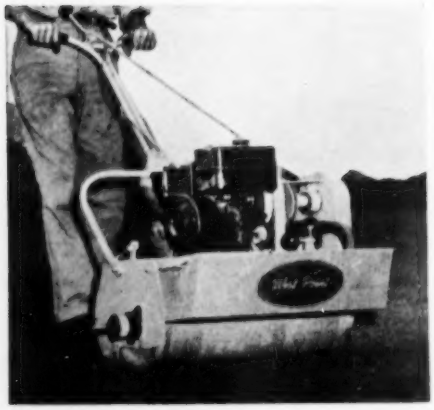
House of steel, brick and plastics uses no wood

EXPOSED beams in this house—built by architect J. Leonard Rush of suburban Detroit for himself—are light steel, spliced and welded at the center and supported by steel-pipe columns. The ceiling is the underside of fiber-and-cement panels topped with roofing of felt and marble chips. Some inside walls are brick, others are plastic on cement blocks.



Longest periscope aids test of nuclear plane engine

THIS 90-foot periscope, called the world's longest, lets engineers watch in safety the working of nuclear reactors designed to power aircraft. Paired with a 60-foot partner, it provides a view of both sides of a reactor in operation. Vision through both is bent around three



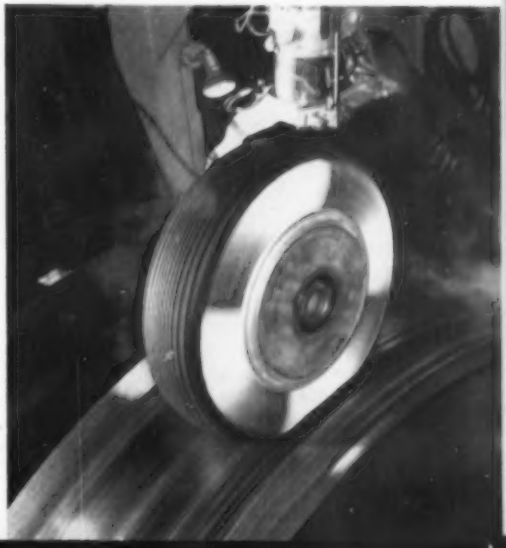
Grass "blotter" mops up rain to dry out golf-course turf

HERE'S one way to avoid postponing a game because of wet grounds. This power turf drier soaks up water with a roller made of a special Du Pont sponge and squeezes it into a storage reservoir. A vacuum attachment sucks puddles dry.

West Point Products, West Point, Pa., manufactures it for golf courses, tennis courts, baseball and football fields.

corners—with the aid of two 45-degree mirrors in the tube and a remote-controlled scanning mirror—to keep radiation from leaking through.

A third has a built-in camera for close-ups (like that of threading a needle above) of mechanical hands assembling parts in a shielded room. GE built them for the Atomic Energy Commission's Idaho Falls station.



Wheel spinning at 250 m.p.h. tests jet-plane landing gear

DROPPED under a 60,000-pound load onto a massive steel wheel rotating at the speed of a jet plane approaching a runway, the landing gear at right takes a ride that simulates what it would undergo on supersonic aircraft.

Bendix Aviation uses the setup to test shock-strut, wheel and brake assemblies at its South Bend, Ind., plant.

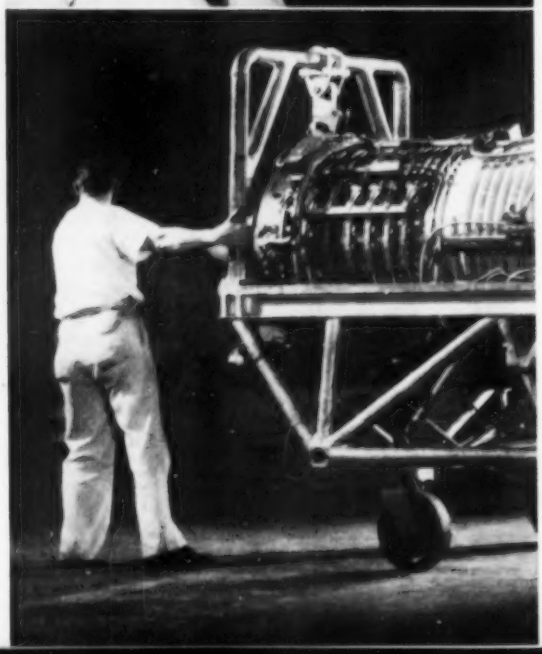
Lightweight engine can zip jets at double speed of sound

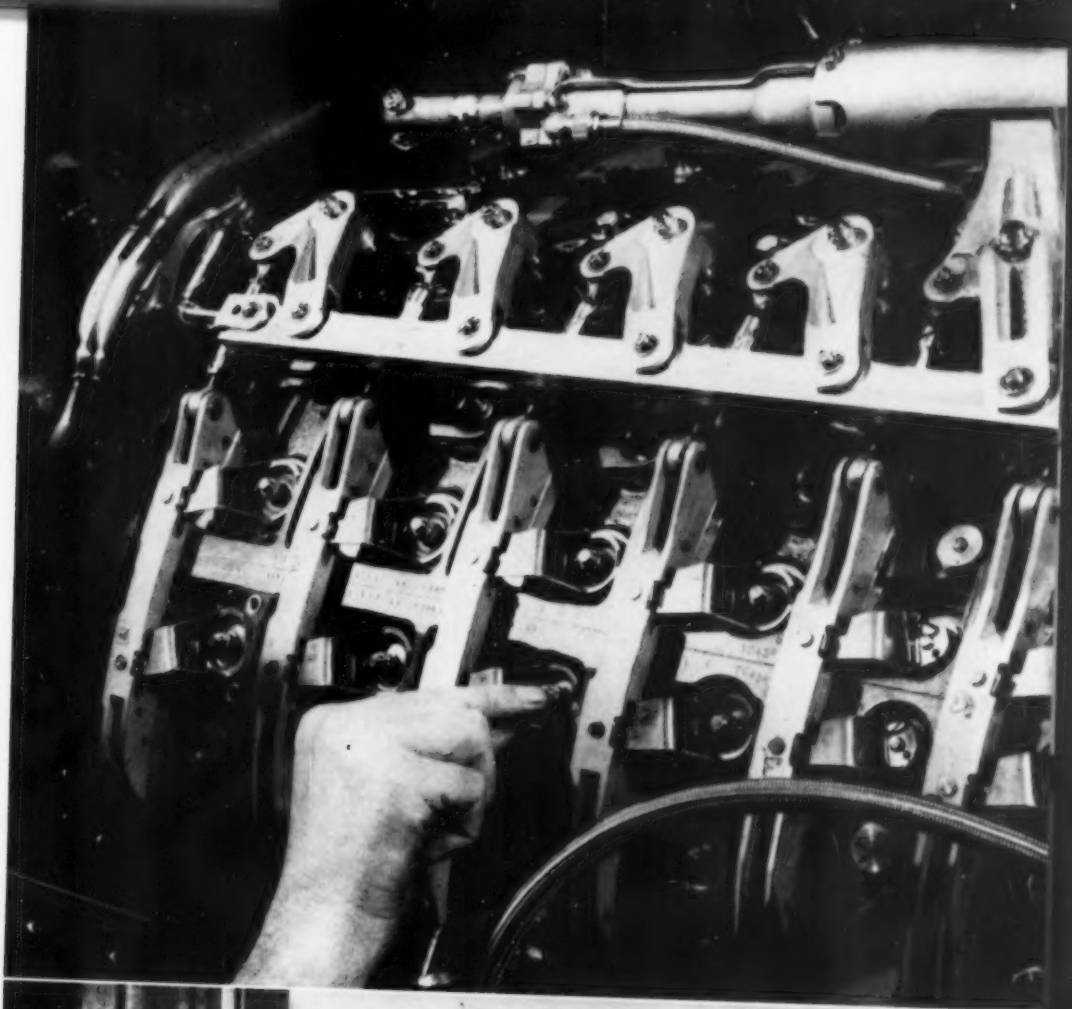
THE variable-pitch compressor blades at right, shown being adjusted, enable General Electric to lighten the weight of its J79 jet engine (lower right), giving it more thrust per pound of engine than any other big jet now in production. The engine can power aircraft and missiles at supersonic speeds.

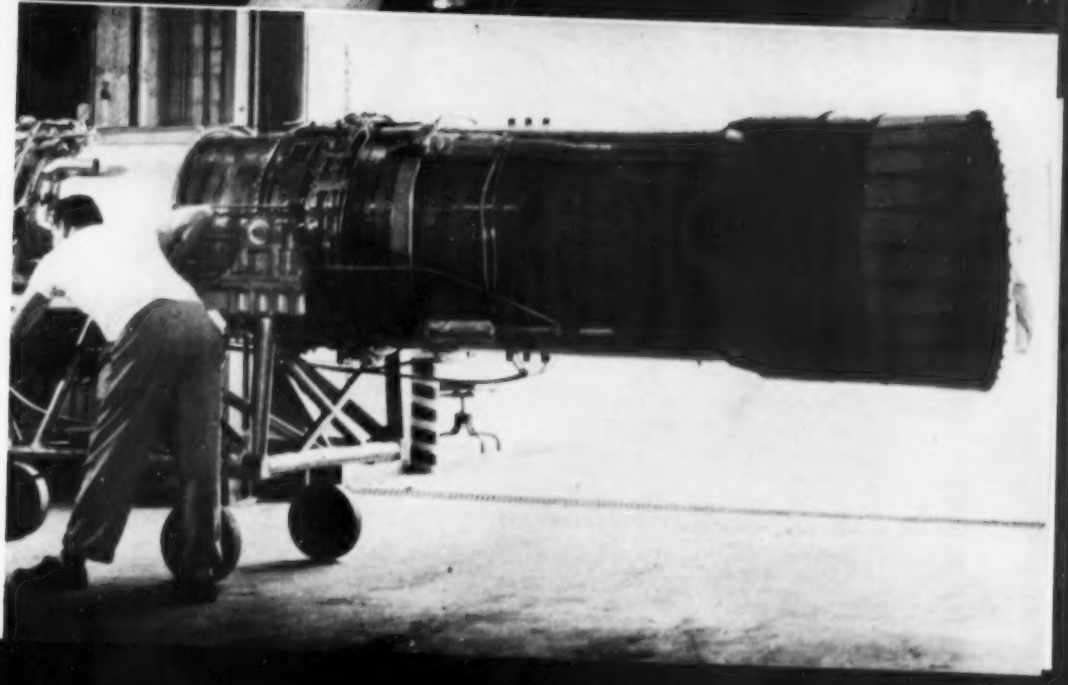
Pitch of the blades is automatically controlled as the speed changes, providing a smooth air flow inside the engine.

Rolling painter lines road fast

THIS self-propelled road marker can paint 22 miles of solid or broken stripe in a day. British made, it sprays paint between two rotating stencil disks. The operator can check on the line as it is laid by looking down through the frame.







Hot-oil pipe grid to keep sidewalk ice-free in winter

THIS network of welded steel pipes will form a heating system designed to lessen snow shoveling this winter. Embedded in the cement sidewalk in front of a building under construction on New York's Madison Avenue between 59th and 60th Streets, it will carry light oil heated to 140 degrees and pumped through when the snow begins to fly.

Radio controls camera to take close-ups from far off

USING a transmitter tuned to a receiver on this camera, you can click the shutter up to a mile away. This version of Standard Camera's 35-mm. Praktina FX is equipped with a radio-controlled motor having two solenoids: one to snap the shutter, the other to advance the film and cock for the next shot. The motor runs on batteries or house current.

Army can flash photo back from front in five minutes

PORTABLE Signal Corps facsimile equipment, using radio (as in the jeep below) or wires, can send a combat-zone or other spot photograph in record time to a point miles away. A Polaroid photo, developed in one minute, can be transmitted in three minutes to Polaroid film in a distant receiver and be converted there into a finished print in one minute more.

New Ideas from the Inventors

1 Idler Drives Tandem Wheels. A three-axle truck could get extra traction on icy or muddy roads with this inflatable, rubber-tired idler transmitting power from the driven to the follower wheels. On good roads, with the idler deflated, the truck would operate as usual with one powered and one "dead" rear axle.

2 Bottle Cap Encloses Straw. There'd be no need to hunt for a straw or cup if bottles of soda and other beverages came with their straws capped in. Formed with a high crown, this bottle sealer would leave space underneath for a drinking straw of exactly the right length.

3 Window Doubles as Awning. Hinged at the top, this tilt-out window could deflect rain and let air into a room at the same time. And with its shade drawn part way or fully down the length of the glass, it would serve also as an awning to block the sun on hot summer days.

4 Bumper Lightens Arm Loads. You might find it easier to carry a heavy object if you could keep it from banging against your leg or trying to trip you up. This cushioned bumper, shaped to fit between your waist and forearm, would help you support the weight, yet hold it clear.

5 Tractor Level Eases Contouring. A farmer would find it simpler to guide his tractor over sloping or uneven ground with a level like this to point the way. The pivoted, counterweighted indicator would mark a horizontal course across a slope, or show the angle of a grade.

6 Shield Stops Bath Splash. With this splash shield hooked over the rim of your bathtub, you could scrub pets—or small children—and not get yourself all wet. And if you held a washed dog until he finished shaking himself off, the shield would also confine the splatters that usually hit the bathroom walls and floor.

Please turn the page for more new ideas

7 Drive Codes Taped Messages. To "scramble" a message on this tape recorder, you'd set a mechanism that would jiggle the tape as it moved past the recording head. The tape could be played back only on a duplicate machine set to repeat the same scrambling pattern.

8 Rake Retrieves Golf Balls. You wouldn't have to get sand or water in your shoes from fetching errant golf balls if you carried a rake like this in your bag. Slipped over the handle of a club, the claw-like retriever would extend your arm's length so you could roll or scoop toward you those out-of-reach balls.

9 Conveyor Brings Files to Desk. A file that had no bottom or top drawers could save bending and stretching. Occupying half the total space, the drawers in this cabinet would ride on a conveyor. Pushing a button would bring the tray you want to the desk-high opening.

The following patents *have been issued on these inventions: 1. Patent No. 2,717,654 to L. Andersen, Richfield, Minn.; 2. No. 2,748,968 to A. Attler, Yonkers, N. Y.; 3. No. 2,718,259 to E. G. and E. W. Smith, College Station, Tex.; 4. No. 2,707,071 to D. Adams, El Monte, Calif.; 5. No. 2,669,787 to E. Wetzig, Sr., Carrizo Springs, Tex.; 6. No. 2,725,576 to C. Schwersinske, N.Y.C.; 7. No. 2,730,569 to C. Street, Stamford, Conn.; 8. No. 2,721,755 to W. Walner, Norfolk, Va.; 9.* **No. 2,758,901 to F. Cole, Jr., Manchester by the Sea, Mass.**

Copies of patents may be ordered, by number, from the Commissioner of Patents, Washington 25, D.C., at 25 cents each. To write to an inventor, if the address given above is insufficient, you may address him (by name and patent number) in care of the Commissioner of Patents.

PS writer-photographer team gives you an eye-witness report on our anti-sub program in an attempt to answer a vital question:

Can We Defend Our Coasts Against Russian Subs?

The Navy's newest sub-killing destroyer makes a furious turn to dodge an incoming torpedo in Key West maneuvers

By Frank Harvey PHOTOS BY W. W. MORRIS

IN THE last war, it was sometimes possible to read newspapers at midnight on New Jersey beaches—by the light of burning American tankers. With less than 200 U-boats, the Nazis were sinking our ships as fast as American shipyards could bash champagne bottles over their prows. Those U-boat skippers had no homing torpedoes, long-range sonar, or atomic missiles. They just eased in out of that big dark Atlantic, upped their attack periscope, and let fly.

Now we have a problem: 400 Russian long-range submarines with homing torpedoes, sensitive sonar, and a fiendish ballistics missile called the Comet, said to be able to dump atomic warheads on any American city within 700 miles of the 20-fathom water that rims our continent.

If World War III broke out tomorrow, what sort of defense could our Navy put up against the Russian submarines?

The answer is certainly not as bright as we'd like—but it's not pitch dark, either. For one thing, we'd know the subs were coming. Reportedly, the U. S. Navy has already installed an extensive underwater warning line similar to the chain of radar stations that the USAF has strung across the gateway to the Pole. The underwater warning system is said to be made of highly advanced sonar devices tied together in long chains on the ocean floor up and down the Atlantic and Pacific seacoasts. Any enemy sub that tries to sneak over

the sonar chain will unwittingly send its calling card many hundreds of miles ahead so that Navy reception committees of ships and planes may be on hand with the latest weapons to greet the visitors.

(Zipper-lipped about this underwater sonar chain, the Navy will not confirm that it exists. Guardedly it says: "A mass movement of submarines would no doubt be detected and reported long before they could reach U. S. coastal waters.")

How hot a reception would these underwater visitors get?

To find out in detail, POPULAR SCIENCE sent photographer Bill Morris and me to Key West, Fla., headquarters of anti-sub activity on the Atlantic coast. A huge sonar school at Key West is grinding out a steady stream of officers and men trained in hunting, chasing and blowing enemy submarines to bits. Their new weapons are good—and better, fearsomely potent weapons are on the way. Let's start with the time-honored workhorse of anti-sub warfare, the destroyer.

A new destroyer has been designed with one thing in mind: sub killing. It can turn on a dime, can actually dodge torpedoes like a clever halfback in an open field, and is equipped with listening gear so sensitive that shrimps may be heard feeding, guppies mating, and subs snorkeling at incredible ranges. A second type of sonar sends out continuous underwater signals that bounce off a whale's belly or a U-boat's flank and come back as a "ping" that gives an instant range and bearing on the unknown. The destroyer skipper can attack in a split second with all the weapons at his disposal.

Weapon Able—standard equipment on the new destroyers—is a giant depth-charge gun that can hurl huge packages of explosive a long way from the ship at a high rate of fire and with excellent accuracy.

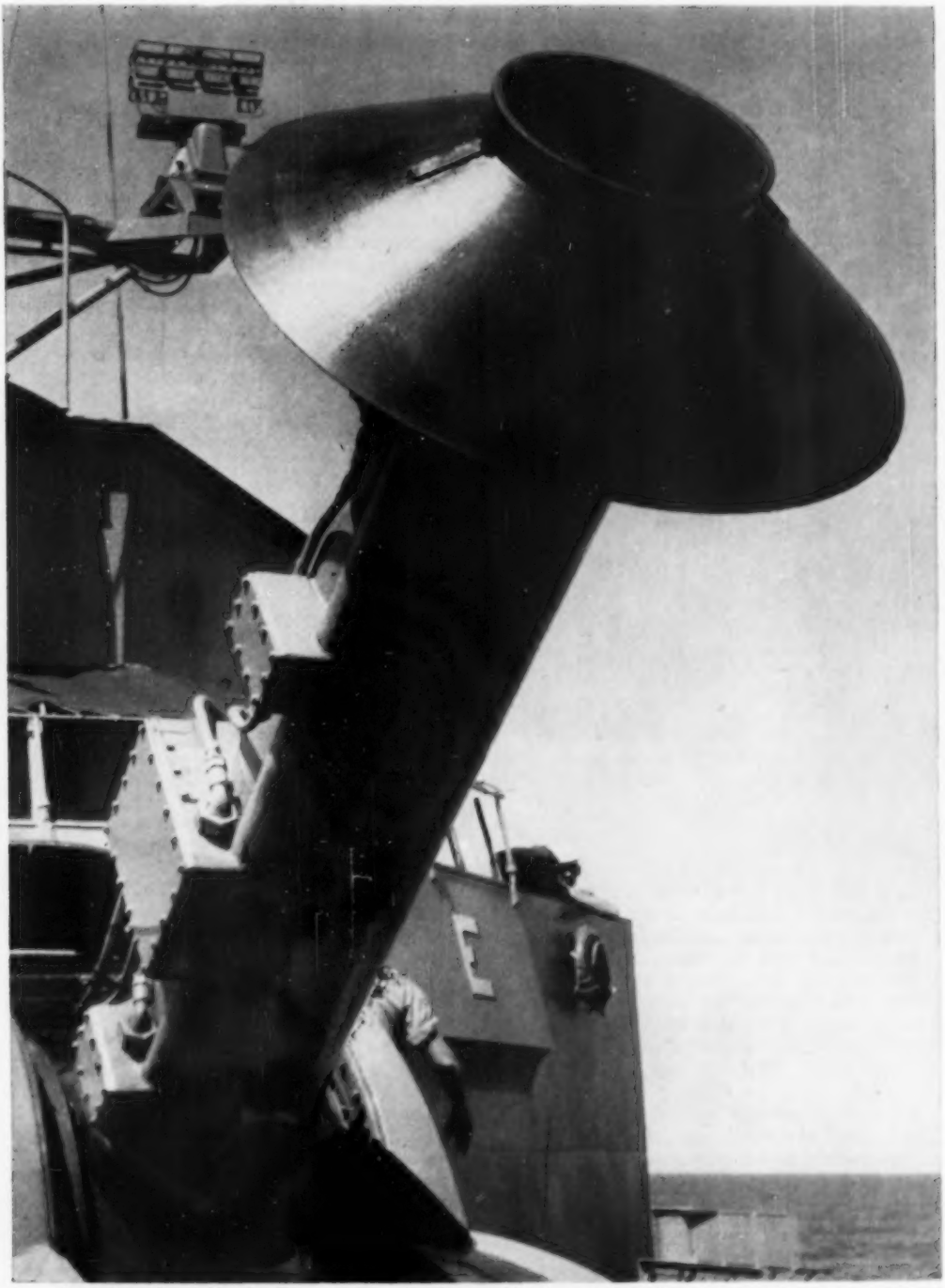
It has been reported—without official confirmation—that the Navy has a ferocious atomic depth charge that is so powerful it must be dropped from airplanes and will kill any sub unlucky enough to be within half a mile of it.

Homing torpedoes (the Navy has a whole family of different types that may be dropped from helicopters, planes or ships) chase down the submarine with sonar brains, like a ferret closing in on a rat.

Destroyer kill techniques, as might be expected, have sharpened considerably since World War II. The sonarman picks up the enemy, shoots the exact position to the radar controller sitting near him, and the radar controller, in a Tinker-to-Evers-to-Chance play, vectors a hovering helicopter to the spot. When the sonar blips of the submarine merge with the radar blip of the attacking whirlybird, it's just depth charges away. Best part of this attack is the fact that the marauding sub never even knows he's under attack until his conning tower caves in like a can of vegetable soup.

High-speed fixed-wing airplanes carry out a variation of the helicopter attack, at night, against snorkeling subs. The plane roars in, depth charges ready, being directed by its own radar. When the submarine blip is directly ahead and just a few seconds away, the pilot turns on a searchlight only slightly less powerful than the sun, leans forward and his eyes strain to catch that telltale "feather." If he sees it, he punches the pickle, releasing his bomb, and makes his

Weapon Able—a new gun



that flings huge depth charges great distances at high speed—is the newest destroyer armament.

circle to pick up the oil slick. This attack sounds red-hot, but it's no better, however, than the "Mark 1 Eyeball," because you can't bomb something you can't see—and you have seconds for the pickup.

But the Navy has still further loaded the dice against the snorkeling sub by denying him the use of his radar through Electronic Counter Measures. ECM is simply a very sensitive pickup to snag radar emanations so they won't bounce back to the enemy's screen.

Submariners are unanimous in saying that they'd rather be attacked by a whole flotilla of destroyers and a skyful of airplanes than by an "anti-submarine submarine." One of the great protections any sub has against surface sonar is the so-called "Thermal Layer"—a level in the sea where the water takes a sudden change in temperature. This layer bends the sonar beams radically. Any sub lying under the layer (which averages about 90 feet down) is almost impossible to detect.

VETERAN INSTRUCTOR demonstrates how an enemy sub shows up on a sonar scope in Key West school. Students look, listen, then go to sea and "fight" with a real live sub.

Not so when he is being stalked by another submarine which is also under the thermal layer. One technique for a killer sub is to lie doggo under the layer in an area where enemy submarines are likely to appear. He has his listening sonar (a supersensitive hearing aid) turned to high gain. When he hears the enemy sub at a great distance, he quickly works out its range and course, by a secret computation, using sound alone. If the enemy is headed toward the killer all he need do is wait for the proper moment and fire. If the enemy is headed elsewhere, the killer sub may rise quietly to the surface and radio the position of the quarry to circling planes.

These planes are equipped with MAD gear (Magnetic Airborne Detection) with which they can "pin down" the submarine until destroyers arrive to sink it. Blimps are also used to tow sonar teardrops at great depth—under the thermal layer—and serve as director stations for the killer subs.

Anyone reading this article might by now have decided that the Navy has it made as far as killing enemy submarines is concerned. But the ocean is very very big, and the submarine, by its nature, almost always has the initiative. If it's merely a question of protecting convoys, then the Navy's new techniques are excellent. I stood on the bridge of one of our latest anti-sub destroyers, the USS Cromwell, off Key West, while some of our most talented submarine skippers tried to get through the screen to hit the "carrier." We dodged tin fish with ease. We "sank" two subs. The destroyer serving as the "carrier" churned blithely through the attackers without a scratch.

Missile-launching submarines are another kettle of fish. They will not be used, of course, if future wars are confined to "brush fire" dimensions. But both our own high command and the Russian leaders have repeatedly served warning that "quality weapons will be used from the outset" in any serious outbreak of hostilities. Quality weapons is a cleaned-up term meaning H-bombs. It isn't pleasant to think of 400 Russian submarines surfacing in unison some dark night off our coastlines and letting fly a sudden shower of Comet missiles with atomic warheads. Our warning net might have alerted us to their presence. But our defensive setup today, as made public, appears inadequate against a concentrated guided-missile launch from offshore submarines. END

NEXT MONTH IN PS: How research chemists developed the super-potent "zip" fuels that will drive our jets and missiles faster than ever and twice as far

Interior designs by John and Earline Brice.

BEGIN WITH A BEAUTIFUL BACKGROUND *of plastic wall tile*

IDEA! A panel of blues in classic design on a wall of white Styron plastic tile.

STYRON

Play up a divider wall! This cheerful contemporary kitchen began with plastic wall tile made of Styron®. Creamy yellow and white squares for walls and counter facings . . . king-size blue squares to accent the divider wall with its butterfly motif in white triangles. The dozens of decorator-styled Styron colors and varied tile shapes will inspire decorating ideas that are as practical as they are beautiful for your whole house. For your certified dealer can guarantee the quality of Styron plastic wall tile and installation. Whether you're building, remodeling or decorating, see your dealer soon . . . and begin with a beautiful background of Styron plastic wall tile. Send 10¢ for a colorful portfolio of designs in plastic wall tile. Plastics Sales Dept. PL 1564T, THE DOW CHEMICAL COMPANY, Midland, Michigan.

YOU CAN DEPEND ON DOW

HERE WAS THE

PROBLEM

1. Drab, colorless kitchen
2. No counter space
3. No cabinet space
4. Tight budget

HERE'S THE

SOLUTION

Working evenings and week-ends, an amateur with no previous carpentry experience, worked this happy change. He bought ready-made birch cabinets, inexpensive hemlock tongue and groove lumber for paneling and used 2 x 4 framing. For $53 he purchased enough Formica and Formica Contact Bond Cement to surface the snack bar, the sink top and the wall area behind the sink. He used Formica Red Capri #33-PR-1. He cut the Formica to size with a hand carpenter saw, used the spreader furnished with the cement and rolled it down with his wife's rolling pin.

And Here's the Formica Commercial — Formica is beautiful. It lasts a long, long time. It's easy and fun to apply. It comes in more than 70 colors, patterns and wood grains. There is only one genuine Formica and the name is printed in washable ink on each sheet. For your Formica dealer, look in the yellow pages of your phone book under "plastics."

FREE! Easy, step-by-step picture instructions for applying Formica to sink tops, furniture and many other surfaces. Write Formica 4726-7 Spring Grove Ave., Cinti. 32, O. and ask for form #359. *In Canada: Arnold Banfield & Co., Ltd., Oakville, Ontario.*

Customers buy Formica because it is a brand name they know and trust

DEMAND THIS CERTIFICATION

We protect this faith in our product by certifying every sheet with a wash-off Formica marking. It is for your protection and guarantee that you are getting genuine Beauty Bonded Formica.

This mark certifies genuine

RUB OFF WITH SOFT OF BAR SOAP OR A DAMP CLOTH

Beauty Bonded FORMICA Pays in Performance

Guaranteed by Good Housekeeping

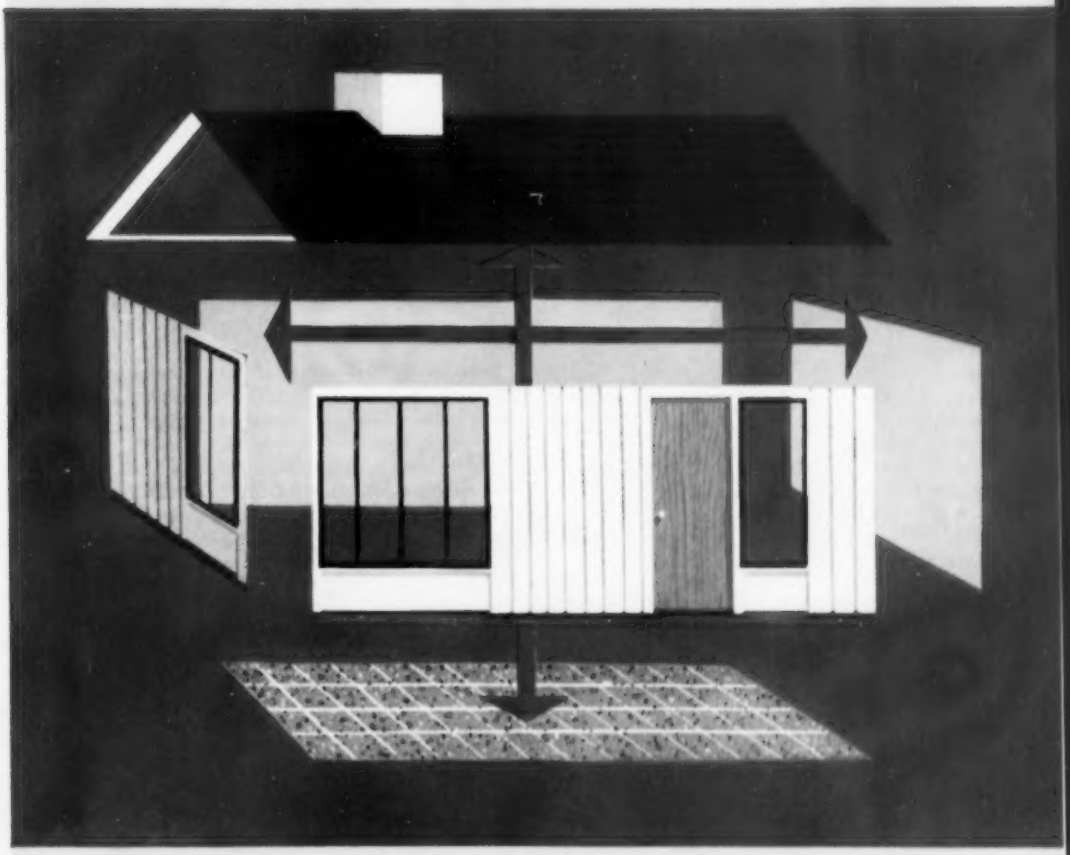
Subsidiary of CYANAMID

Seeing is believing. If this wash-off identification is not on the surface, it's not FORMICA.

New Living Space for Your Home

Home and Shop

...where to find it ...how to add it



- Raise the roof
- Build an addition
- Panel the basement
- Enclose the porch
- Finish the garage
- Try room dividers
- Knock out surplus partitions

How to Shop Wisely for Loans, Labor and Lumber

YOU can save up to 50 percent on the cost of home improvements by doing your own work. But you can also relax in the back yard while others do the hard work—and still save money.

Here's how:

• Be your own contractor. Hire the mason, carpenter, electrician and so on yourself. You may save up to a third this way. Find out by getting estimates for all separate jobs. Compare the total with the best overall contract bid.

• Shop for the best loan. This can save you hundreds of dollars in excessive interest or back-breaking payments. Some loans require costly plans that may not be necessary. You can save up to 10 percent if you don't need them.

• Get at least three bids on anything to be done or bought.

• Steer clear of cost-plus deals. Cost bills can be padded. And be wary of a contractor who asks money in advance.

• Have all costs and specifications in writing and signed before work starts. Misunderstandings can be expensive.

• Take advantage of quantity discounts and "cash-and-carry" plans. Many lumberyards offer a five-to-10-percent discount if you buy materials in bulk or carry them home yourself. Some dealers may also let you spread a bill over several payments without charging interest.

• Use the cheapest grade of materials that will do. On many finishing jobs, structural strength isn't as important as in original construction, and lumber can be of lower quality.

• Plan ahead. If a new room will need heat, find out if your present system is adequate. Avoid costly errors by planning a logical sequence of construction.

• Protect yourself against the chance of expensive accidents on the job with liability insurance, and be sure that workmen are covered by compensation.

The painless way to pay. You'll spend more on a long-term loan stretching over years, but payments are a lot easier.

With an "open-end" mortgage, you can often re-borrow up to the amount you've already paid off. Veterans with VA mortgages can sometimes increase loans similarly.

The added payments are low—for $4,000, probably about $30 a month. But you'll have to submit plans and may not be permitted to do any work yourself.

If you have a standard mortgage that's low—or none at all—you may be able to get a new long-term mortgage. In this case, the bank lends you the money on your present property and doesn't usually care how you spend it.

Because of rising interest rates, however, a new mortgage will probably cost you more than your old one. Figure the difference, and add in the legal and other fees, which may run to $200 or more. You may find it more profitable to try to swing a short-term loan.

On some life-insurance policies you can borrow up to the cash-surrender value. The interest rate is five to six percent, but your money continues to earn dividends at about two percent, so the actual rate is only three to four percent.

There's a temptation, however, not to pay an insurance loan back since you aren't required to (the loan is deducted when the policy is paid). Unless you re-

pay it promptly, you'll pay years of interest to borrow *your own money*.

Short-term non-collateral loans. These cost you less, but payments may be steep. Usually, the most you can borrow is $5,000—in some areas $3,500—with up to five years to repay.

Interest rates are sometimes misleading, so know exactly what you pay. On a 4½-percent installment loan—the kind you pay back every month—the actual interest rate is about double the advertised interest because you're charged the full rate even on the money you repay.

On finance-company loans—the kind that come with a "we're your pals" pitch—the interest may be "only" 2½ percent, but it's 2½ percent *every month*. It could cost you *30 percent a year*.

Always find out exactly how the interest is figured. You shouldn't have to pay more than four to six percent a year. FHA loans start at five percent on the first $2,500, then drop to four on the next $1,000. On a three-year loan, you repay about $32 a month for each $1,000.

FHA loans are sometimes easier to get than a bank loan, but you pay an extra ½-percent interest for insurance, and the terms are very strict. You have to submit plans and can't buy anything removable, such as a refrigerator. Banks giving conventional loans are much less fussy about how you spend the money, and such loans are available at the same or lower rates.

Often you can save even more on a *personal* loan. If you want $2,500, one New York lender requires 24 payments of $114.71 a month on a home-improvement loan, but only $113.85 on a personal loan—saving more than $20.

Collateral loans. Instead of selling stocks or bonds to get money, you can often put them up as security for a collateral loan. The advertised interest rate is higher than on straight loans—usually six percent—but it's a true rate. Your stocks or bonds are earning money meanwhile, so the actual cost of the loan may be only one or two percent.

Collateral loans are commonly made for three or six months. At the end of a period, you pay off the loan or extend it for another period. The advantage is that you can borrow a little money as needed if your project spreads over a year or more. You don't pay interest on money that you won't use right away. END

6 Ways

YOU can find additional living space in your present home in one or all of six different ways. You can:

1 ***Use all your space all year.*** During the cold months, an open porch or breezeway is just waste space.

In each case you already have a floor and a roof. Add walls, extend your heating lines, and you wind up with a low-cost, year-'round addition—new space for a new bath, bedroom, dining room, whatever you need.

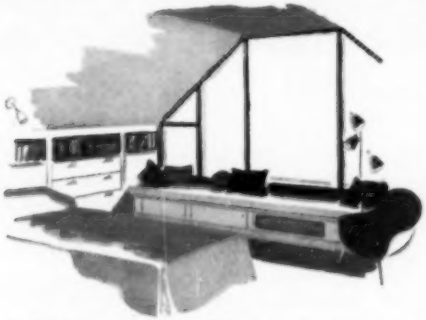
Breezeways seemed a fine idea a few years ago. But one by one, as families have grown, the breezeways have been walled in, front and back, for useful living space. Car ports can sometimes be adapted the same way.

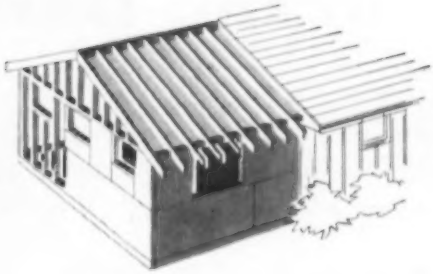
2 ***Establish living quarters in space that's now inefficiently used—a garage, basement or unfinished attic.***

Moving into the attic or basement—often used for nothing but dead storage—has the same effect spacewise as adding a second story.

If your space needs are really urgent, parking a car in a garage is the poorest

to Add Living Space





kind of economy. With a garage, you are well on your way to a spacious addition. Regular coatings of preservative car wax are far less expensive than building an addition from scratch.

3 ***Add to the actual cubic footage of space within the house.*** A sideways extension will do this, as will raising the roof to use an attic where the present headroom is too low.

The latter is often accomplished by raising all or part of one side of a gable roof to a dormer position. Of these two ways of gaining space, the roof raising is much less expensive.

4 ***Rearrange the interior walls.*** You may desperately need space in one part of the house but have room to spare in another part. The walls are just in the wrong place.

Rearranging walls can be very simple or very tricky, depending on whether they are load-bearing. Usually, walls that run in the same direction as the floor and ceiling joists are non-load-bearing, and can be safely removed.

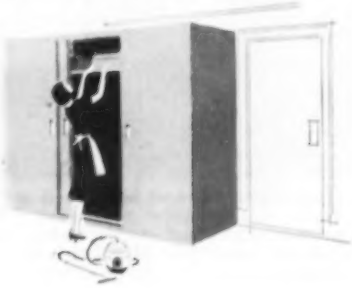
A movable room divider often gives better use of a large room. A divider that stops short of the ceiling gives a room an open feeling that makes it seem larger than it is.

5 ***Make some rooms do double duty.*** A separate dining room is often used for only one meal a day. It might also serve as a sewing room, TV room, even as a guest room or laundry. Such doubling up sometimes frees space elsewhere in the house for more urgent use, perhaps as a new bath or bedroom.

6 ***Install modern storage units.*** Well-planned closets and storage walls can actually make more *living* space available.

Storage-wall units can give as much square footage as an ordinary closet and save floor space besides. Here's why:

The back of a storage-wall unit is usually a sheet of plywood or hardboard, no thicker than half an inch. Backs and fronts of an ordinary closet are full partitions, five inches thick. Add the difference in both front and back, and a storage-wall unit could save as much as nine inches—¾ of a square foot of floor space for every running foot of closet.



You Can Live in the Basement Now

An underground movement in homes is under way. Here's a down-to-earth report on it

MODERN building methods and materials can make a basement just as livable as space above ground. Yet most homeowners let this valuable living space go to waste.

Need an extra bedroom? Put it in the basement. Many people have.

Looking for space for a family room, playroom, large dining room, laundry, darkroom, workshop? You can probably find it in the basement.

In a one-story house, a basement occupies almost half the total cubic footage. Put the basement to efficient use and you are in effect adding another floor to the house.

Consider these points:

- It costs only $1 to $2 a square foot to add living space to the basement compared with $10 to $15 above ground.
- The construction job is easy because nothing you do in finishing a basement affects the basic structure of the house. The walls, floor and ceiling are already in—you just cover them over.
- Modern basements have higher ceilings, more windows. They're no longer dreary. Clean, compact heating plants can be partitioned off, out of sight.

Problems solve themselves. Just finishing off a basement in itself may cure conditions of cold, dirt and dampness. As you cover up the walls, floor and exposed pipes, you make the cellar warmer, seal out dust and eliminate the cold surfaces that cause condensation.

Substitution of fluorescent fixtures for old bare bulbs often transforms a cellar into a bright, cheerful room without requiring new wiring. Acoustical ceiling tiles are handsome yet inexpensive, go up fast and help deaden basement noise.

Adding heat isn't as difficult or expensive as it may seem. New registers can be

DINING ROOM is cool for summer entertaining, warm and rustic for winter use. Walls are rough-plastered and studded with random half logs. Alternate pairs of ceiling joists are boxed with plywood for a heavy beamed effect.

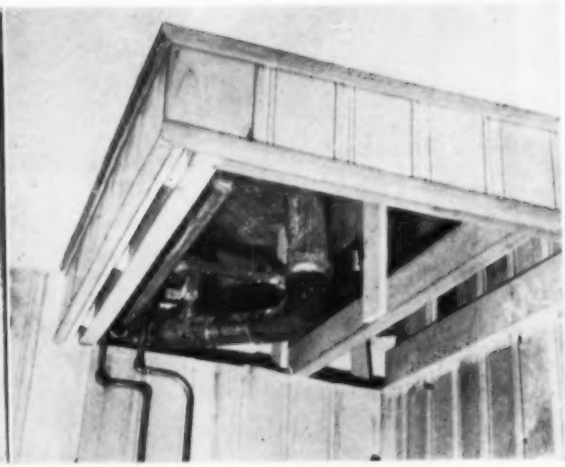
BEDROOM—proof that you can sleep in the basement, too—serves guests or a bulging family. Walls have insulation batts stapled between studs and are covered with inexpensive plasterboard panels prefinished to look like wood.

LIVING ROOM is as fancy as you could wish—yet it's in the cellar. Painted lally columns, combined with decorative poles and planting boxes, help screen room from other areas.

GAME ROOM provides activities for the whole family. Ping-pong table doubles for dining, can be pushed aside for dancing. Foot-thick storage wall hides heating plant at rear and houses books, phonograph and record cabinets.

TV ROOM has set built into a wall, keeping floor clear for other activities. Space for set is made by carrying wall paneling across an alcove, which also hides water pipes and gives room for additional shelves and storage cabinets.

SHORT TWO-BY-THREES fill gap at edges of the ceiling where the joists run parallel to the foundation. New wall framing can then be fastened to them. Make use of similar filler blocks where a partition falls between two joists.



JUMBLE OF PIPES can be neatly enclosed with a frame suspended from ceiling joists this way. Bottom can then be tiled to match the ceiling. Where pipes cluster, a single enclosure is better looking than individual pipe covers.

cut in existing warm-air ducts that run along ceiling joints. Special finned convectors are also made to clamp on exposed steam or hot-water pipes and deliver heat directly to the cellar.

If excessive moisture results from scant ventilation, you can mount an ordinary window fan or an exhaust fan in the wall. An electric dehumidifier will draw gallons of water from the air daily. Dehydrating chemicals also help.

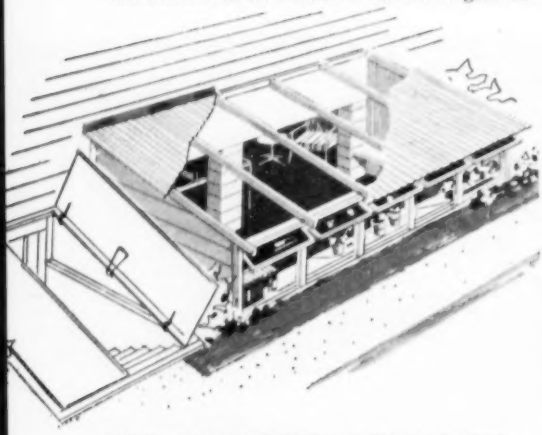
Moisture from outside can be stopped by painting the masonry walls with a bituminous coat before you cover them over. And use the type of insulation that has a built-in moisture-vapor barrier on the side facing the room. This will keep inside moisture from getting behind your wall to cause rot and a musty odor.

How much will it cost? Finishing costs usually fall into three groups according to typical prices. Using the least expensive materials, you can spend as little as $200 to $300 to finish a 16′-by-20′ basement room; $300 to $500 using medium-priced materials; and up to $700 or more for special paneling and built-ins.

Here's how the main items break down:

The basic framing is the same no matter what you put over it. For a 16′-by-20′ room, you'll need about $40 worth of wall studs and $15 worth of one-by-two furring strips to mount ceiling panels on. You may spend even less for studs if you can use odd-lot 7′ lengths, which are cheaper than cutting up 8′ or 14′ pieces.

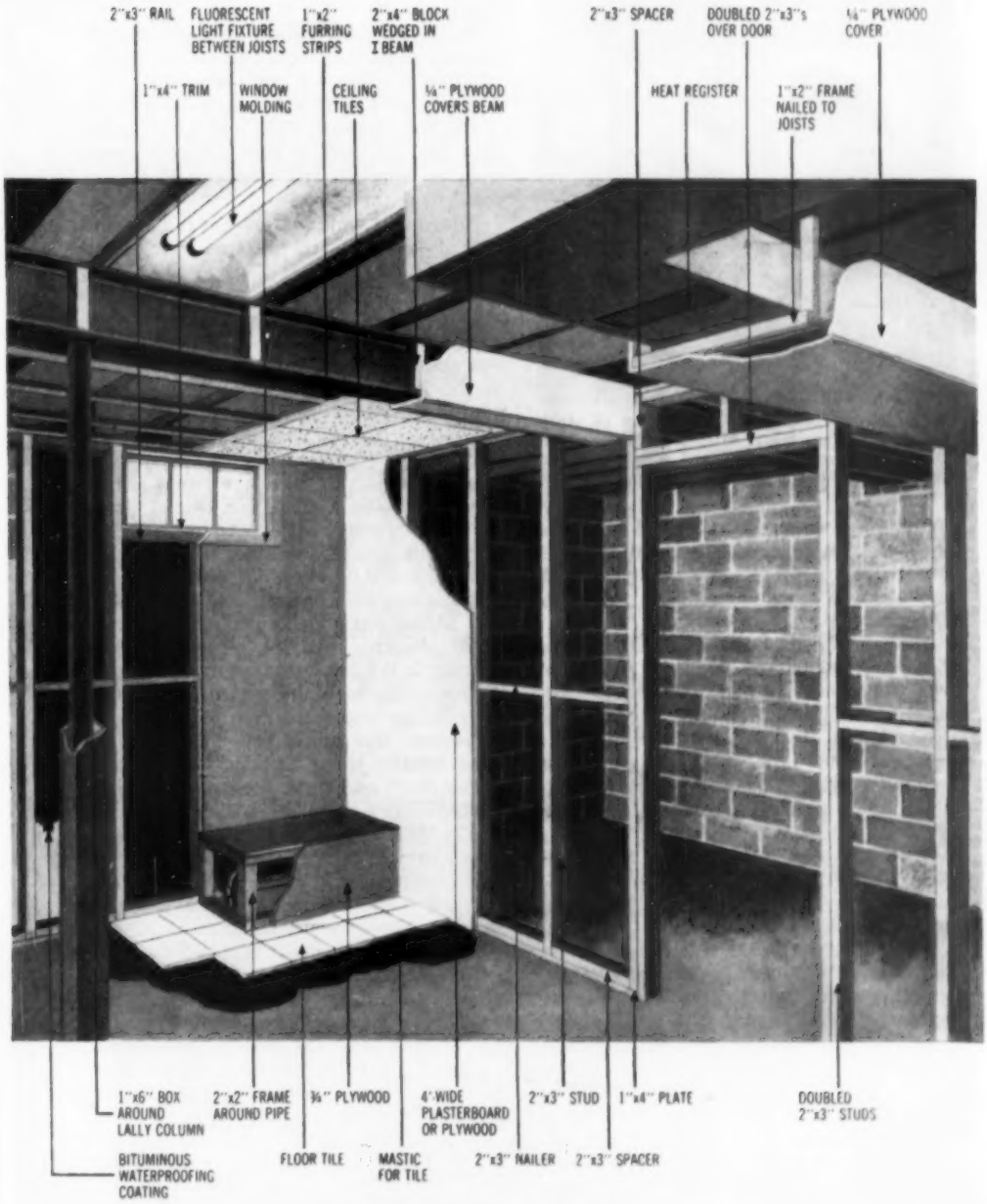
To cover walls, large sheets of plasterboard or hardboard, at five to eight cents a square foot, are the least expensive. You could completely panel the same 16′-by-20′ room for $30 to $40. For $100 to $150 you can use solid wood paneling, such as



You can enlarge a basement

A GOOD BASEMENT is sometimes worth making even better instead of building a more expensive addition above ground. One way to gain light, air and more space is to add a plastic-roof enclosure like this. Masonry or steel piers can be substituted for the foundation wall.

What to do where on a typical basement-finishing job



SMALL DOORS like this make it easy to reach meters, fuse boxes and other controls without leaving them exposed. Hinged panels made of the same material as walls are almost invisible.

knotty pine, or several types of softwood plywood. These cost 20 to 30 cents a square foot. Still fancier are hardwood plywood and plastic-faced panels at 40 to 60 cents a square foot.

Acoustical ceiling tiles range from 12 to 15 cents a square foot, so that a 16′-by-20′ area would cost $40 to $50. Many plywood and other decorative panels for walls also come in convenient squares for ceilings at 25 to 35 cents a square foot. For a low-cost ceiling, plasterboard and hardboard can be used at half to one-third the price of acoustical tiles.

Ceiling light fixtures, made to fit between the joists, cost $5 to $10 for a single-bulb, recessed type, $15 to $25 for the larger fluorescent units.

What kind of floor? Until recently, only asphalt tiles were recommended for use below grade on concrete. They're still cheapest and serve well. For a 16′-by-20′ floor, you'll spend only about $35 for some dark colors, including adhesive to lay them, and about $50 for the more decorative light colors.

For about twice the price of asphalt, you can use the newer vinyl-asbestos tiles that are now made for basement floors. These provide a more resilient, longer-wearing floor than asphalt.

For tops in luxury, many lumberyards now carry specially treated hardwood parquet floor blocks that can be set in mastic directly over concrete. These come in 9″ squares and cost about 60 cents a square foot.

Basement with a view? Instead of small window wells that collect leaves and trash, you can cut away a strip of earth about 2′ deep and 4′ to 6′ wide along the outside of the foundation. This will let in more light and air and, if planted with small trees or flowers, will give you a garden scene from the cellar.

Additional windows are not hard to install if you stick to the small basement type. These have self-supporting steel frames and can be cemented into openings at the top of the foundation without special framing. A row of these, several feet apart, provides an effect very similar to the high, shallow windows found in many modern homes—upstairs.

Studs or furring strips? Wall paneling is sometimes placed on one-by-two furring strips, but you'll have a warmer, drier basement room if you use two-by-three studs. They cost a little more than furring strips, but provide considerably more insulating space between old wall and new.

Studs simplify construction, too. Nailed only at the top and bottom, they're easy to set straight. Furring strips, fastened directly to the concrete, follow the irregularities in the wall and make it harder to get a flat surface.

Because the finish walls support no house weight, there's a trick you can use to save work and time. Instead of resting the studs on a thick sill, which is hard to bolt to the floor, a thin one-by-four board is first spiked to the concrete. Directly overhead, marked by a plumb bob, a second one-by-four strip is nailed to the ceiling joists. The studs are then held by spacer blocks between these two top and bottom strips. The blocks, all cut to the same length, automatically space the studs the correct distance apart and eliminate having to toenail the ends of the studs.

With studs set 24″ apart on centers, you can put up 4′-wide sheets, with a support at the center and edges of each panel. For squares and planks that come in 16″ widths, space the studs 16″ apart. For narrow boards, studs can be up to 3′ apart, with furring strips nailed horizontally across them. END

Installing a New Basement Door

BASEMENTS are sometimes built these days minus an outside entrance, but you don't have to continue living with such an inconvenience. One contractor adds a new entrance for around $300, including a factory-made steel hatchway.

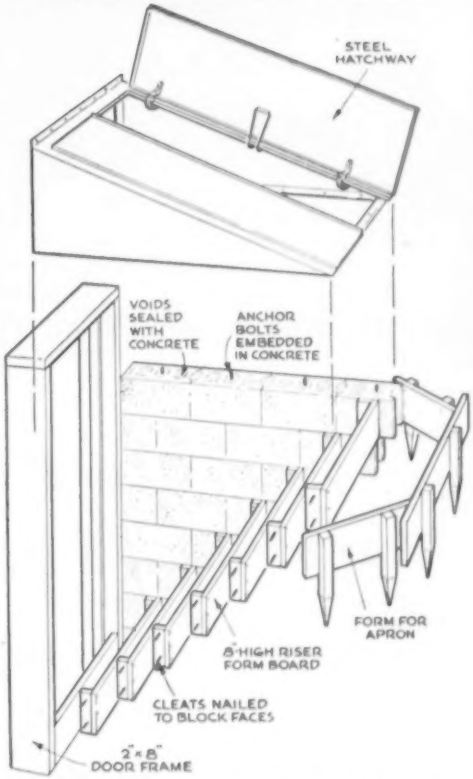
Doing the job yourself, you can expect to get by for $100 less. Here's how:

First, determine what size hatch you'll need to cover stairs sloped at 45 degrees to the basement floor. Then dig out a sloping area where the hatchway will go.

A rented electric hammer will make quick work of knocking an opening in the foundation wall, even if it is of poured concrete. With a cinder block wall, you can get by with a hammer, cold chisel, and goggles.

Use concrete blocks to lay up the side walls, starting with shallow, step-like beds of concrete. Fill voids in the top courses, embedding anchor bolts where needed for the steel hatch. Nail cleats to the walls to hold the riser form boards. Erect form boards for the apron.

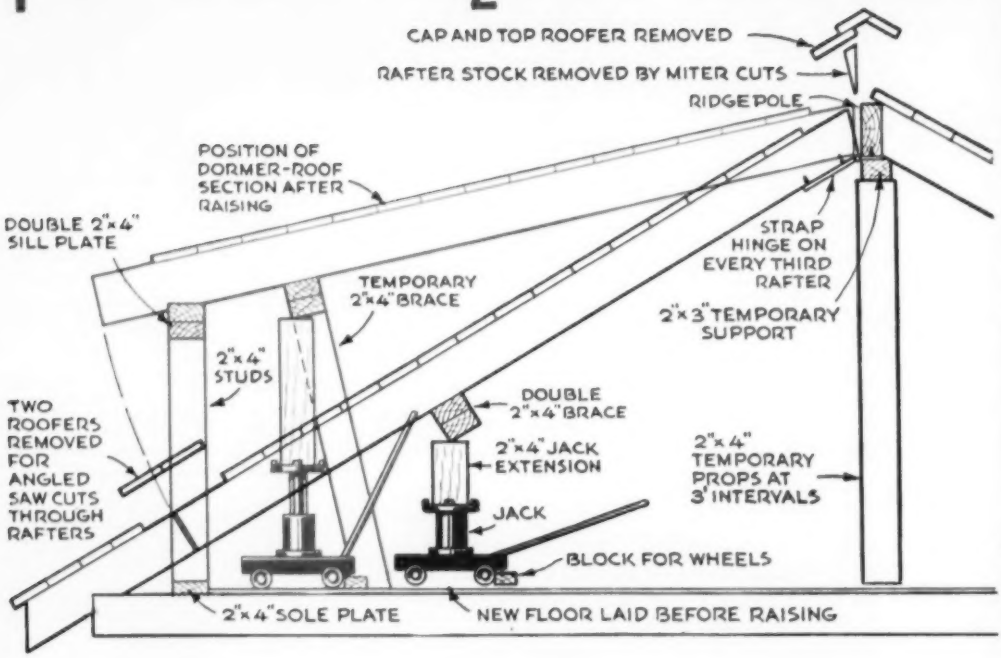
Pour concrete behind the riser form boards, working up, step by step. Then pour the apron. Drill holes at the head of the stairs and insert plugs to take the expansion bolts that hold down the hatch sill. Lower the hatch into position over the anchor bolts. Use anchor screws to attach the rear of the hatch to the house. Frame in the doorway with two-by-eights and hang a heavy door.



CONCRETE STEPS are poured directly on inclined earth excavation by one contractor (below). Cleats on the side walls hold riser form boards.

1

2



IN THREE days, the house pictured above gained a second story. Raising the roof turned an unusable attic into two spacious bedrooms and four big closets.

Shingles were removed around a 10′-by-25′ section of roof (1), and the rafters were mitered and hinged at the ridgepole. Then a wheeled car jack (rented from a garage) began raising the hinged flap (2) to dormer height. Studs were driven in (3) and windows installed. Sheathed and flashed (4), the new dormer was then ready for finishing (5).

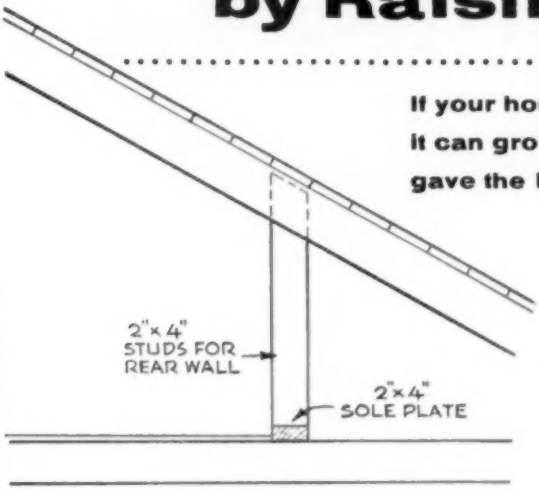
The change was made over a single long weekend on the home of Mr. and Mrs. Leonard Baltz Jr. in Clifton, N. J. Like thousands of others these days, they wanted the greatest amount of new space in the easiest way at the lowest cost. The dormer was the answer. It came close to

3

4

Expand Your Attic by Raising the Roof

If your house can't grow sideways, maybe it can grow upward. Here's how a dormer gave the Len Baltzes two new bedrooms

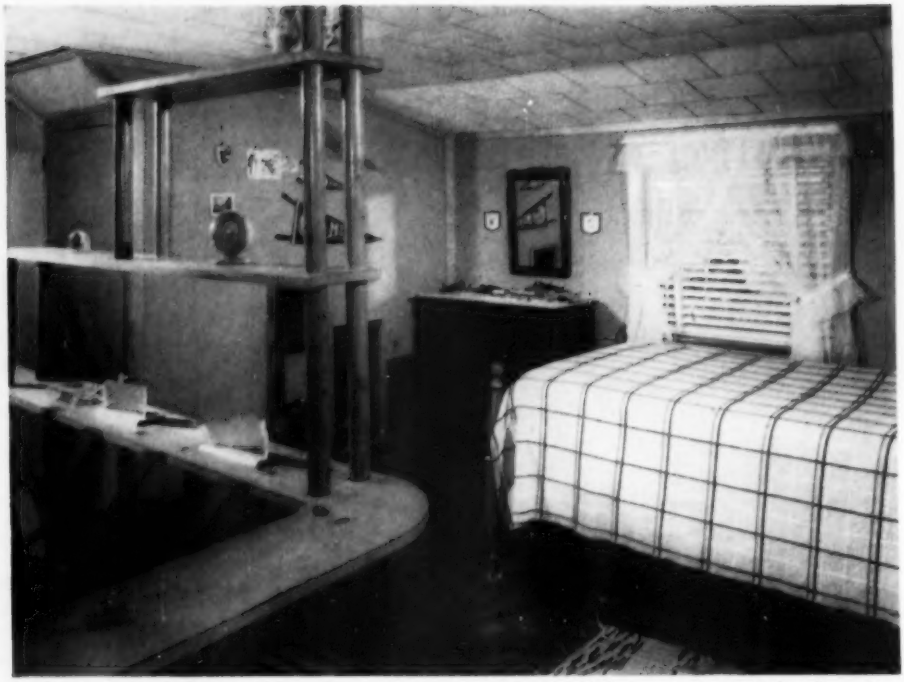


5

doubling the living space in the Baltz home.

Roof raisings like this are becoming a popular way to solve the space problem. One major contractor has been averaging two dormers a day. In one community, 2,000 homes have already been converted from one to two stories.

It's easy to see the reason for this boom in dormer construction. Of the two



WHAT THE BALTZ FAMILY GOT: Two spacious rooms like this one are each 15′ square and have large storage cabinets under roof eaves. Stairway at left is screened off by decorative shelves made with closet-pole posts. Total space: 3,500 cubic feet. Total cost: $705.

ways you can expand your house—upwards or sideways—a new top floor gives you the most for your money. The way it was done on the Baltz house, you need only enough lumber to frame in under the lifted roof and for partitions. Finishing off the inside costs no more than doing the same job inside a conventional expansion attic.

Doing the work himself, Len Baltz spent $265 to raise his roof—including $65 to a helper—plus $440 to finish the interior. Even doing no work yourself, prices for raising a roof, at the Long Island rates, start as low as $350.

With a dormer, you bypass many of the expenses of a separate addition—you already have the foundation, roof and most of the walls. It takes up no yard space and is easier to keep warm since you now use a lot of heat that's ordinarily lost through the roof. If you want a bathroom, you can often locate it over one downstairs and run new pipes only a short distance upward.

Three styles of dormers are commonly built. The setback type starts at knee-wall height up the roof and gives you one window in a bathroom-size space. The Baltz type usually starts 1½′ from the front or back of the house and extends to within one rafter space at each end of the roof. A flush dormer raises all of one side of a gable roof.

Even a second floor that already has the small type dormer can be greatly improved. You can raise the roof between two end dormers, or expand a central one from each side, and make one long dormer with full ceiling height.

In the Baltz job, horizontal two-by-sixes were spiked across each pair of rafters after the hinged roof section was raised. These lock the rafters in their new position and form ceiling joists. They were placed as high as possible for maximum headroom, but below the attic air vents. Insulation was then run between the joists so that heat is kept within the new room without interfering with ventilation between the ceiling and the roof peak. END

Why Not Expand into the Garage?

Need more ground-floor living space? A remodeled garage is your big economy package

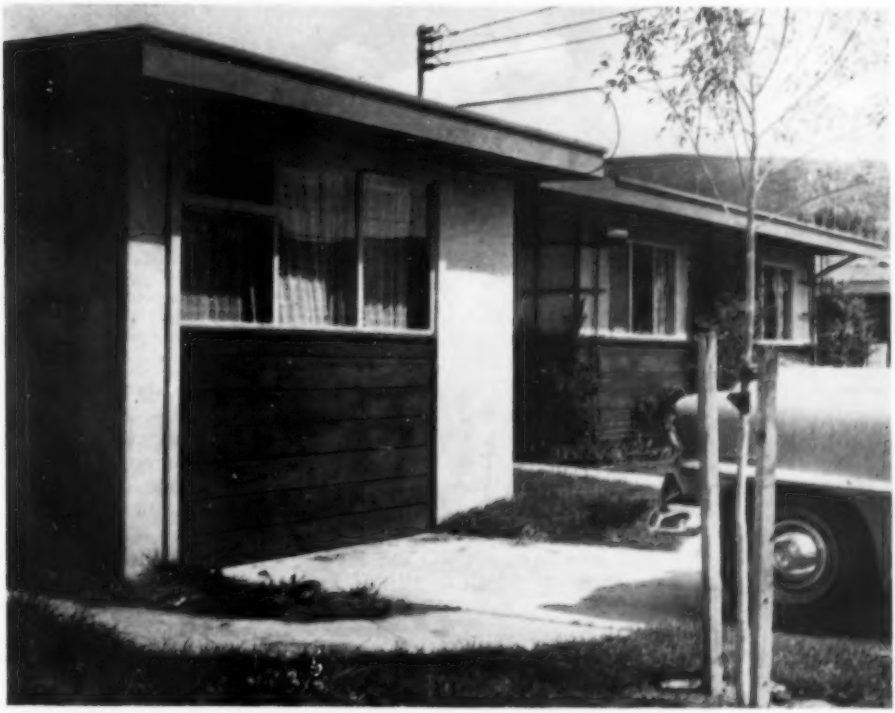
WHEN you convert an attached garage into additional living quarters, you pocket at least $2,000. That's the money you don't have to spend for costly exterior work—excavation, foundation, framing, sheathing and roofing—on a new house wing of equal size.

Garage space is *big* space. The average single-car garage measures about 10′ by 20′. Depending on your needs, you might convert this space into:

- An expansive family room for the overflow of household activities.
- A dining room and pantry, to take the place of a cramped dinette.
- A master bedroom and bath.
- Two medium-size bedrooms.

If you own a two-car garage, you can pick up the equivalent of a small cottage in new living area. Or, if you want to keep one car indoors, the obvious solution is a fireproof partition to cut the garage space in half.

A separate garage with a connecting



TRACT HOME ON A SMALL LOT may offer only one solution for a family that's bursting at the house seams—a garage conversion. Here's how the David Wardells, of Glen Ellen, Calif., gained 264 square feet of floor space for a family room. Cost of necessary materials was only $337.

How you can convert three types of garages

BREEZEWAY-ATTACHED: This is a natural for new sleeping quarters on the ground floor. A hall at the back of the breezeway gives complete privacy. Bathroom is accessible from outdoors.

SINGLE: Here, the kitchen becomes a desirable buffer between formal and informal living quarters. Being next to the kitchen, the family room can also serve as handy utility space.

DOUBLE: This is a compromise conversion. By breaking through a hall-closet wall, the one-car garage can still be reached from indoors. The new bath serves both bedroom and kitchen.

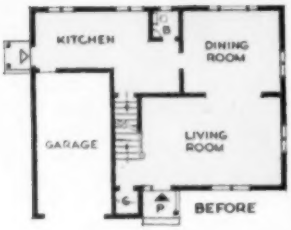
breezeway is another potential space maker. Just closing in the breezeway may give you all the additional room you need. Again, you may want to retain part of the breezeway as a porch, enclosing only a corridor to new living quarters in the garage.

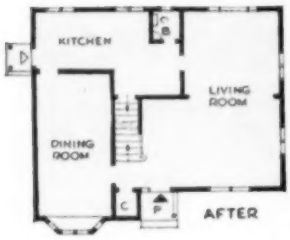
But before plunging into any garage-remodeling job, here are a few things to consider:

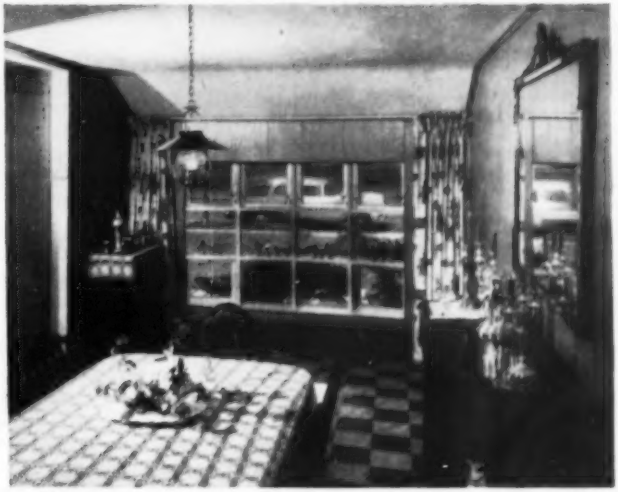
Closing in the door opening. The average single-car garage has a doorway approximately 8′ wide. That gives you an opening for a picture window large enough to "daylight" the entire garage area. It is also one of the many places where you can hold costs to a minimum, or splurge, as you like.

In southern climates you can build a wall from garage-floor level to window-coping height, and frame and single-glaze the opening above it, for less than $50. Elsewhere, the exterior wall will have to be set on a footing poured below frost line. But you'll still be ahead of the game if you frame the opening for stock window sash.

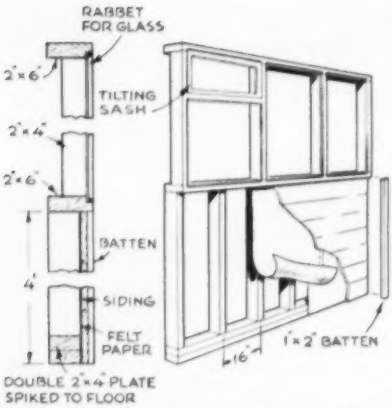
On the other hand, you may want to shoot the works on an eye-filling bay window—in modern lingo called a "bow bay." A number of firms offer multiple window units that can be assembled for







THEY GOT A BOW BAY. Dining and living rooms were too small to suit the James Scanlons of River Edge, N.J. So Jim, who works for U.S. Plywood, slipped a bow bay into the garage-door opening, raised the floor, and broke through two walls for doorways to a brand-new 12' by 20' dining room. The old dining room is now a part of the Scanlon living room. Materials, including luxurious Honduras-mahogany-surfaced plywood for the walls, came to around $1,800.



SIMPLEST WAY TO CLOSE A GARAGE is this easily made wall unit that the Wardells used on their California home. Lower half is standard stud construction, paneled to match the house siding. Except for one tilting window, glass is puttied directly into the rabbeted upper frame, saving the cost of sash. How the new room looks on the inside is shown in the photo below.

this purpose. They come in a wide variety of sizes and can be combined to provide practically any bow-bay width from 5′ to 21′. All are furnished with both stationary and tilting sash, hardware, summer screens, and either double-strength glass or insulating glass. Prices range from around $165 to $765, depending upon the size of the assembly and the type of glazing.

With these bow-bay units, you still must supply the footing, supporting wall section, and roof. But such an installation adds immeasurably to the appearance of your garage-conversion job, both inside and out.

Floors. Instead of laying tile on an existing concrete garage slab, you may want to build a wood floor, or subfloor for tiling, on joists above the slab. This is desirable for resilience, better insulation and, often, to maintain the floor level of the rest of the house.

Check your ceiling. Will it give you enough headroom for such a change? If not, you can still have a wood floor at the present slab level by breaking up the concrete and excavating to a depth that will provide at least a foot of air space under the new joists. You should run a ventilating duct from this into the cellar or out under the garage wall to a window well.

To support the joists, you'll need ledges of poured concrete or of concrete blocks just inside the garage's two long foundation walls. (In a two-car garage you'll need additional support down the center.) These need not go as deep as the garage-wall footings, but they should provide a broad and solid base.

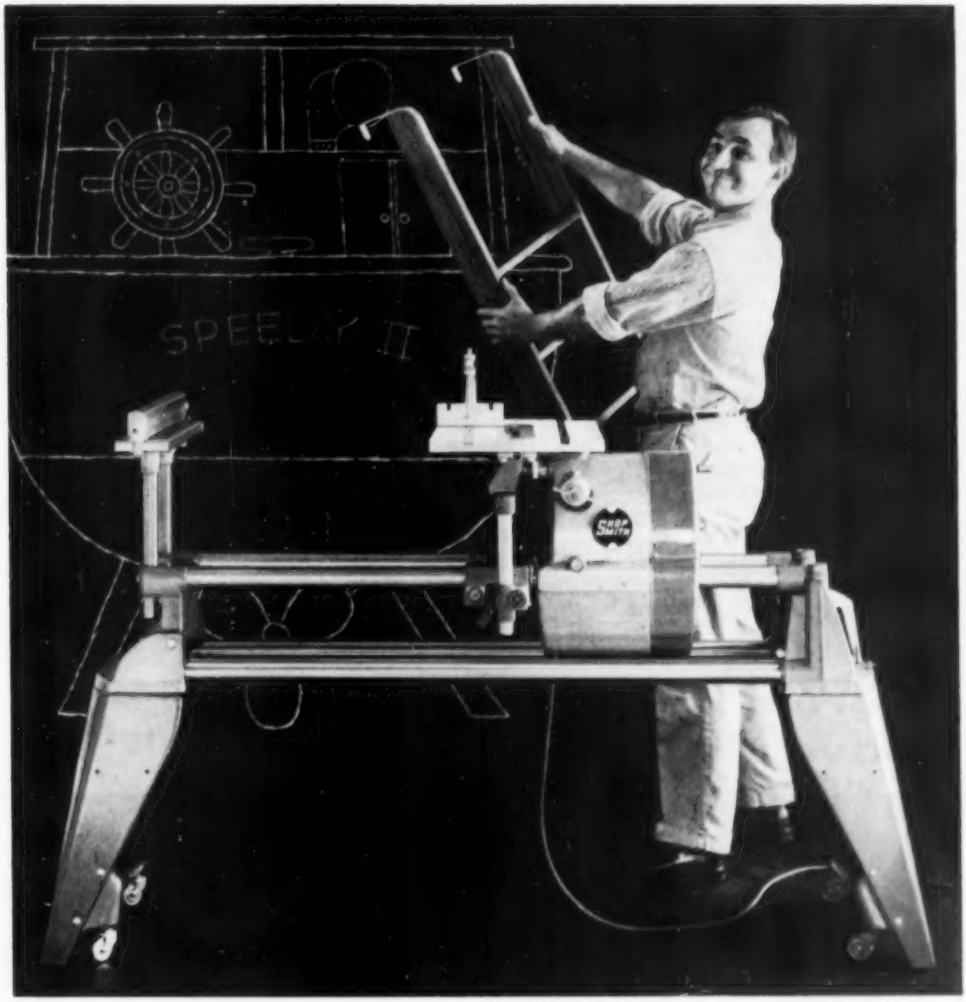
Interior walls. In warm climates, you may prefer to put only a coat of masonry paint on the inside wall surfaces. Alternatives are plywood, solid wood paneling or wallboard, nailed to furring strips attached to the blocks with cut-steel nails.

On a wood-framed garage, insulation batts should be stapled or nailed between the studs of all outside walls before applying panels or wallboard.

Ceilings. Many garage ceilings are rough-plastered. If the texture of such a ceiling satisfies you, just give it a coat of paint. Otherwise, use the present job as a scratch coat for smooth finish plastering.

Garages with exposed ceiling joists offer two possibilities. You can level the undersides of the joists with furring and apply ceiling tiles or plasterboard. Or you can recess narrow panels between the joists for an exposed-beam effect. In this case you brad the panels to furring nailed to the sides of the joists at the desired height.

Heating, lighting and plumbing. Does your present heating plant have the reserve capacity to handle the new living space? Frequently it does, particularly in a two-story house with an attached garage. If you have bedrooms above this unheated area, they may have been drawing heavily upon the furnace, in spite of garage ceiling insulation. Enclosing and insulating the garage relieves the plant of this burden so that it usually has



It's amazing — the things you can build with SHOPSMITH!®

Maybe you won't begin by building a cabin cruiser—but you *could* with your SHOPSMITH! For boats, like most other projects, require a saw, drill press, sander, lathe and horizontal drill. Only SHOPSMITH gives you, in one magnificently engineered unit, all the tools you need to build *any* project from *start* to *finish*. Only SHOPSMITH is a complete power shop—no extra tools to buy. And unlike one-speed power tools, SHOPSMITH gives you exclusive Speed-Dial with correct, *safe* tool speeds for any woodworking operation. Visit your leading hardware or department store, lumber yard, or any Montgomery Ward; find out why over a quarter-million men now own SHOPSMITH. For two helpful free books on home workshops, write Dept. 301-S, Magna Power Tool Corporation: Menlo Park, Calif., or Box 2808, Ft. Wayne, Ind. ® T. M. REG.

SHOP SMITH

MAGNA POWER TOOL CORPORATION

ONLY SHOPSMITH LETS YOU COMPLETE THE JOB!

sufficient capacity to heat the garage.

Wiring is not usually a problem; most garages are already wired for at least one light. Use the existing cable to get power from the house, but have the end at the fuse box reconnected as a separate circuit. Then you can add more lights and outlets in the garage without having to run a new cable.

Be sure to install all fixtures before you cover the walls with paneling. If the walls are already covered, or if you plan to leave the concrete exposed, surface raceways can be used to run power to lights and outlets. These aren't as desirable as concealed wiring, but they don't require you to tear your walls apart.

If your remodeling plans include a bathroom, lavatory, or laundry tub, check your present house layout. Can you tie into the existing water lines and waste pipe easily? More often than not you can, because a majority of garages are placed close to the kitchen. But you can save expense, even here, by spotting new fixtures as close to the kitchen wall as possible, to keep your pipe lines short.

House layout. Integrating your new living area with the old one is even more important than construction details. A garage that cannot be reached from a living room without passing through a kitchen would be ideally located for a rumpus room. But it would make a poor dining room. In the latter case, providing an independent hallway, either by shortening the kitchen or enclosing an open porch, will often solve the problem.

Worried about leaving your car outside? You shouldn't be. Today's automobiles are engineered from the paint job in to take the weather, and 60 percent of them never see the inside of a garage unless they're being serviced or repaired. But if you want to ease your conscience you can always build a car port, and still be many dollars ahead.

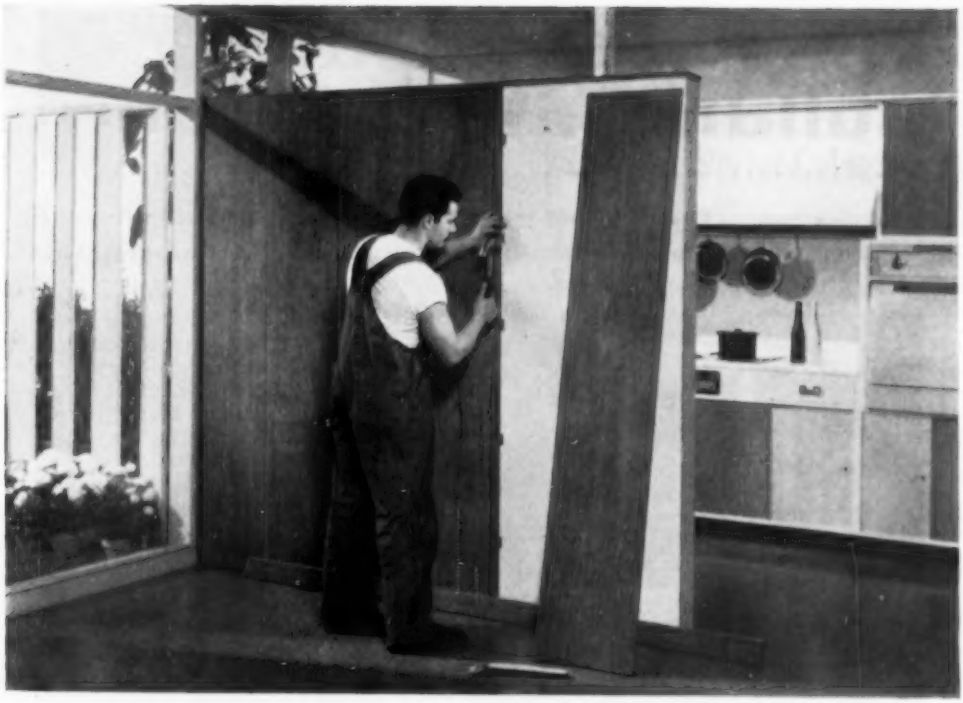
Your garage ties up some $11 a square foot of floor area—based on national average house-construction costs. At that price, many a family may well ask: Why share our home with an automobile?

Here's How You Can Have a Cedar Closet

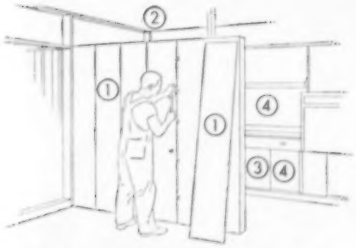
HANDY PACKAGES of aromatic red-cedar paneling are available at lumberyards, tongued-and-grooved for easy installation. The cedar boards can be nailed directly over the existing wall.

PANELING IS INSTALLED by starting at floor, working up. The boards are grooved on ends, as well as sides, to provide airtight enclosure. The door must fit snugly.

JOB COSTS ABOUT $50 for a closet of average size, 3'-by-5'-by-8'. This includes the paneling, four- or six-penny nails, and cedar quarter-round molding to close off the corners.



Modernize a room in a weekend with soilproof Marlite paneling!



Soilproof Marlite areas: 1. silver walnut Planks. 2. polar white Blocks. 3. pastel blue Hi-Gloss panels. 4. dusty pink Hi-Gloss panels. Interior designed by Ving Smith.

In a matter of hours you can turn a dingy room into a bright, modern interior with Marlite paneling. Marlite's exclusive tongue and groove joint cuts hours off installation time; assures beautiful results. Planks (16" x 8') and Blocks (16" square) go up without muss or fuss over new walls or old. And Marlite's soilproof plastic finish is washable. It resists dirt, smudges, stains . . . cleans with a damp cloth. This weekend, see your lumber dealer for Marlite in distinctive wood finishes, marble patterns, beautiful "Companion Colors." Ask him for your free decorating ideas book or mail coupon below.

Guaranteed by Good Housekeeping

Marlite®

PLASTIC-FINISHED
WALL and CEILING PANELING

Marlite Division of Masonite Corporation
Dept. 926, Dover, Ohio

***FREE!** Please send free 16-page, full-color decorating book (over 40 illustrations) packed with dozens of ideas to help you build and remodel better for less.*

Name_____

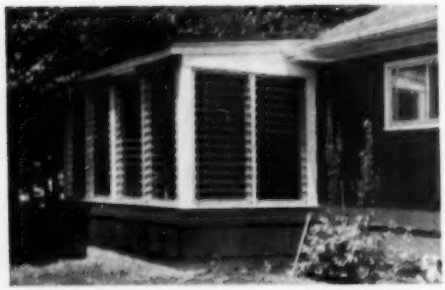
Address_____

City_____ State_____

ANOTHER QUALITY PRODUCT OF MASONITE® RESEARCH

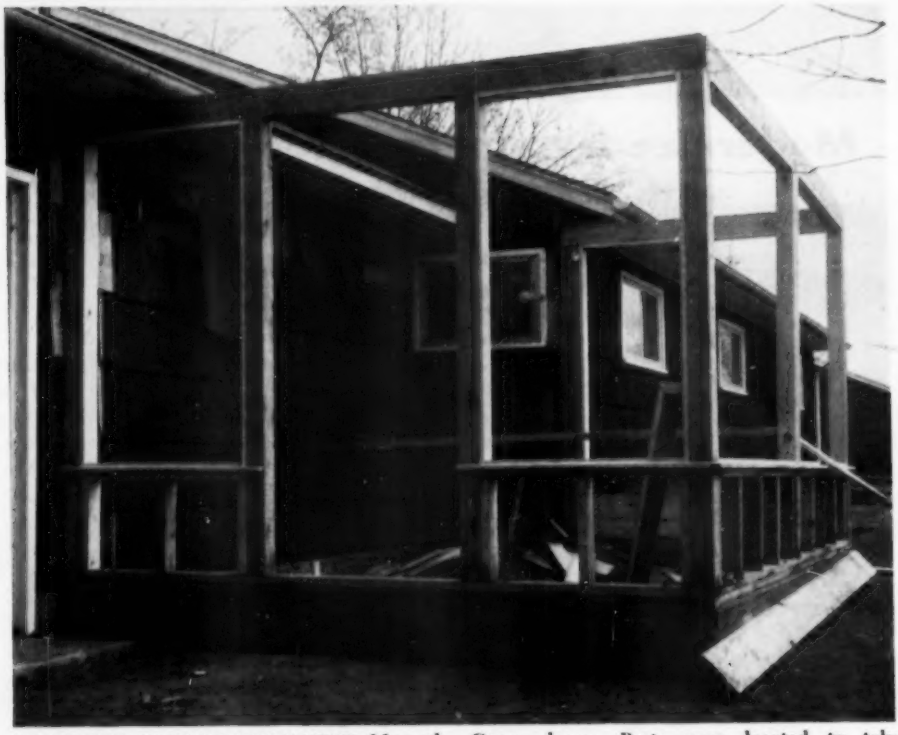
The Facts About Building an Addition

The obvious way to get more elbow room in your present home may actually be the smartest way

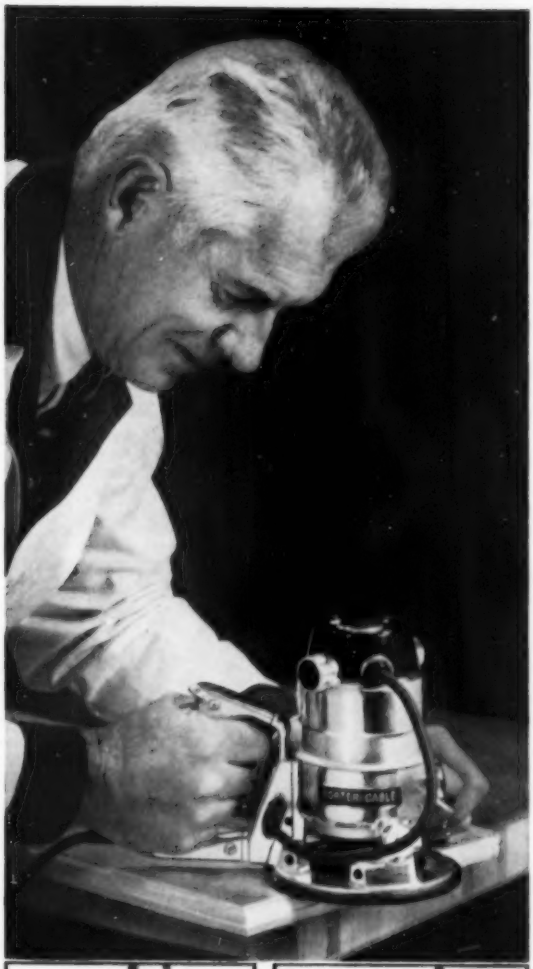


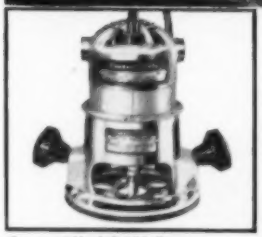
BUILDING an addition to your home is often the best way to increase your living space even though it may sometimes be the most expensive.

You can get exactly the kind of space you want—the size, shape and arrangement that best suits your needs. And you can get it in a way that does the most for your house—makes it bigger-looking, gives it distinction and also increases its



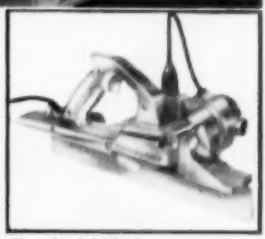
AN ADDITION IN THE MODERN MANNER. Mr. and Mrs. William Pond needed more space, liked the looks of a modern jalousie enclosure. They got both in this smart addition to their Norwalk, Conn., home. Posts were located to take stock-size jalousie frames, which were bought first. To permit wide spacing, four-by-fours were used instead of conventional two-by-four studs.





Famous Model 100 Router now with full 7/8 h.p.

Designed with more power than ever. Does all professional cuts with greater ease and accuracy. Features include: non-marking base, precision ball bearings and a high-speed, interchangeable motor that may be used for Power Plane and Shaper. An outstanding value at only $57.50.



New Model 150-P 16" Plane Attachment

World's finest production plane. Use with your choice of 3 router motors. Trigger switch for safer, instant-power control. Planes up to 2¼" wide. Fingertip depth control is adjustable up to 3/32" cut. Only $49.50 complete with cutter. Without trigger switch, only $44.50.

Now – Porter-Cable offers

the newest, most complete router line anywhere!

There never has been a quality line of Routers and accessories so complete, so outstanding in design, in versatility, in solid value.

- A full 1¼ h.p. Router at $79.50
- A full 5 amp. Router at $49.50
- Famous Model 100 Router–now full 7/8 h.p.–still $57.50
- New 1½ h.p. Router–revolutionary pistol grip and trigger switch–$130

Plus the only big capacity Shaper Table using interchangeable motors; two outstanding new Plane Attachments; six new door-hanging and Router-Plane kits; and a full line of accessories for each.

See these new professional quality tools at your Porter-Cable dealer today –or write for full information now.

Porter-Cable

Quality Power Tools

PORTER-CABLE MACHINE COMPANY
7159 N. Salina Street, Syracuse 8, N. Y.

sanders • routers • saws
drills • shapers • planes

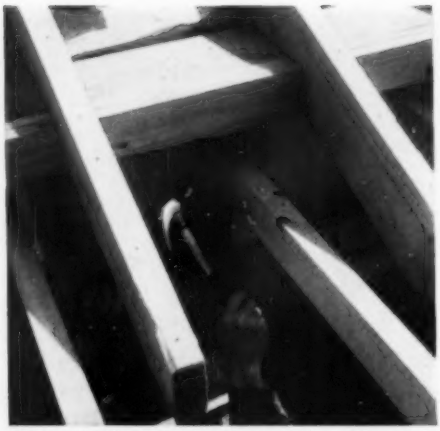
In Canada: write Porter-Cable Ltd., Box 5019, London, Ont. Canadian prices slightly higher.

value. What you pay will come back later.

The cost of building an addition at contractors' prices averages about $10 to $15 a square foot. This means that a 10′-by-12′ room will cost from $1,200 to $1,800.

Careful planning is very important, however, if you are to get the most for your money. Consider these points:

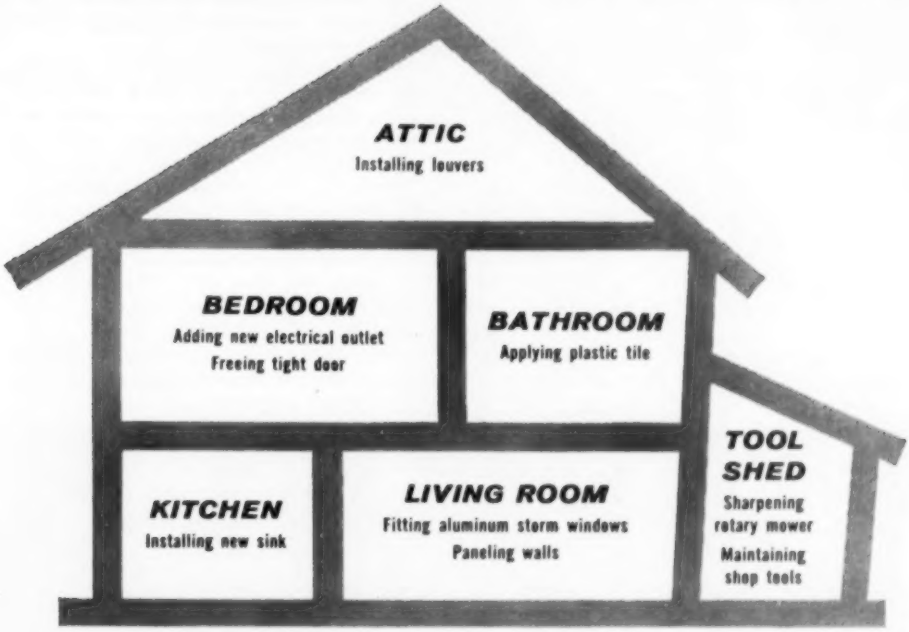
- The room you add need not be the room you want. If you want a bathroom, a better and more economical arrangement may be to add a bedroom and convert an existing inadequate bedroom into a bathroom. That way, you get both a bathroom and a better bedroom.
- Additions offer a chance to correct faulty floor plans. An addition may thus involve remodeling or modernizing other areas of the house and converting them to different use.
- Smart placement of an addition can save money. By using the space formed



NEW CEILING JOISTS were securely anchored to the Ponds' house by removing just enough siding to expose tops of existing wall studs. Joists were then spiked to the sides of the studs.

TRIAL FIT was made on first rafter by blocking it up until exact angle and length were found. Outer end was notched to rest flush on top of new wall, and overhang was trimmed level on the underside. Rafter was then used as pattern for cutting others all alike. Two-by-sixes, used here, handle spans up to 12′; two-by-eights are needed for longer spans.

NICHOLSON FILES FOR HOME PROJECTS



These are only a few of the jobs that Nicholson and Black Diamond files help you do. We could list hundreds. In any case, you can be sure that we make just the right file for the project at hand. When you buy *your* files at your dealer's make sure they're made by Nicholson. Only the best are good enough for your home.

FREE BOOK! "FILE FILOSOPHY"—big new edition made to order for home craftsmen. All you have to know about selection, use and care of files. Send for your copy soon.

NICHOLSON U.S.A.

NICHOLSON FILES · *A FILE FOR EVERY PURPOSE*

BLACK DIAMOND U.S.A.

NICHOLSON FILE COMPANY, 19 Acorn Street, Providence 1, R. I.

(In Canada: Nicholson File Company of Canada Ltd., Port Hope, Ontario)

by an L-shaped house, for example, you need only two walls to complete the enclosure. A haphazard location can cost money; don't, for example, put it where it will be inaccessible to power equipment and concrete trucks.

• Clever design of an addition can improve exterior appearance. It can make a high, boxy house long and sleek, a nondescript or look-alike house distinctive, a modest house big and impressive. Poor design may lower value, make a house hard to sell.

In planning, an architect is low-cost insurance against a botched job. Figure his charge at 10 to 12 percent of the construction cost. For partial service you may be able to get him at $10 an hour.

If you go it alone on design, stay on safe ice by keeping trim, finish, materials, roof and window lines the same as on the existing structure. Keep building lines simple.

Foundation. Having the needed excavation done with power equipment may cost $12 an hour, and take only an hour or two, but few operators will move equipment to a job for less than $50. Save by watching for equipment working nearby. Then dicker to have them stop at your place. They may waive the minimum.

Your addition will have a foundation on solid ground below the frost line. It will consist of a wall 8″ to 12″ thick, resting on a footing that's as deep as the wall is thick and twice as wide.

Power equipment will make a trench at least 2′ wide. You can then pour a concrete footing directly in the earth, or between form boards set in the trench, and on it build up a masonry wall to the height you require.

For a low wall, you can save by digging your own foundation by hand and pouring the wall and footing in one operation. Widen the trench at the bottom and build up wood forms for that part of the wall that extends above ground. Put in anchor bolts to hold the sill, if local codes require them.

If you have a concrete wall poured for you, figure its cost at $1 to $1.25 per square foot. Figure the cost of a block wall at 80 cents per square foot.

Floor. A poured-concrete slab is generally the most economical type. If you are

STRIP OF ROOF was peeled off the Ponds' house to expose rafters, then new rafters were attached with ⅜″-by-4″ bolts. Rafters can pivot temporarily on one bolt for adjustments.

The Stanley Router is a basic tool in your woodworking shop

The router shown here, cutting a decorative edge, is Stanley's No. H45. Its ½ hp Stanley-built motor powers a wide variety of bits at a smooth cutting 22,000 rpm.

This router is a basic tool in your woodworking shop for two very good reasons.

1. The router does hundreds of woodworking jobs like Decorative Cuts • Tongue and Groove • Strip and Block Inlay • Mortise and Tenon • Scrolls • Hinge Mortising • Rounding Edges • Dovetails • Rabbets • Beading.

2. The router motor is the power plant for other Stanley Electric tools you can add as you need them. Attachments readily convert router to a plane or shaper, and fit it for dovetailing, grinding, beading and fluting, or hinge mortising.

H45 Router $49.50

HOW TO BUILD YOUR POWER TOOL SHOP

Buy the router and add accessories as you can. The big plane shown here is powered by the router motor . . . with the H170 Plane Kit you convert readily. Other attachments, conversion kits and a full line of Stanley "Hi-Hone" bits and cutters available when you want them.

H170 Plane Kit $44.75

Ask your dealer to show you Stanley Routers and accessories. For free Catalog 400, write Stanley Electric Tools, Division of The Stanley Works, 639 Myrtle St., New Britain, Connecticut.

AMERICA BUILDS BETTER AND LIVES BETTER WITH STANLEY

STANLEY

This famous trademark distinguishes over 20,000 quality products of The Stanley Works—hand and electric tools • drapery, industrial and builders hardware • door controls • aluminum windows • stampings • springs • coatings • strip steel • steel strapping—made in 24 plants in the United States, Canada, England and Germany.

anywhere except the Deep South, include 1″ foamed-plastic insulation around the slab's perimeter. That's where the slab loses most heat. Also for a warmer slab, put your heat there—radiation pipes or warm-air ducts. In the latter case, have the ducts loop the perimeter, and run the insulation down under them.

To keep moisture from seeping through the slab into the house, first put down a sub-base of 4″ to 6″ of well-compacted coarse gravel and top it with a vapor barrier, such as sheet polyethylene plastic. Run the barrier up under the perimeter insulation and tack it to the sill.

The poured-concrete slab need be only 3⅝″ thick. Reinforce it with 6″-by-6″ welded-wire mesh. Never permit any wood to remain embedded in the slab or anything to puncture the vapor barrier. Have the slab finished off very smooth. You'll then save by being able to use the thinnest gauges of floor tile over it.

An alternate type of floor is wood construction over a crawl space. The floor will stay warmer and drier if an opening can be made into the main house foundation to heat and ventilate the crawl space. If this is impractical, insulate the floor and add vents in the foundation walls—at least two square feet of opening for every 100 square feet of crawl space. A vapor barrier laid over the earth is essential to keep out dampness.

Walls. The wall begins with a sill, usually a two-by-six or two-by-eight. It should be set in mortar to help seal the space between it and the foundation wall. If a slab is to be poured against a sill that isn't covered with a vapor barrier, staple 15-pound felt to the sill to keep it from absorbing water from the concrete.

In average construction, wall studs are two-by-fours on 16″ centers, doubled at corners. If your wall height is 8′, buy your two-by-fours in 16′ lengths and cut them in half. They'll be straighter than eight-footers. Choose the straightest ones for corner posts, plates, and door and window frames. Be certain your construction does not require special custom-fitted doors and windows. They're expensive enough in stock sizes.

Remove the exterior finish and sheathing from the house where the addition's walls meet it. Solidly nail the studs and framing of the new walls directly to the studs and framing of the existing house. Cover the walls with tongue-and-groove sheathing or sheathing-grade plywood. Tack building paper over the sheathing before you apply the finish siding.

Roof. The simplest and most economical to build is a single-pitch, or mono-slope, "shed" roof. It blends well with other roof types. Further economy: Leave the underside exposed for a beamed-ceiling effect. To prevent heat loss, put down the rigid type of insulation on top of the roof before applying the roof surface.

A double-pitch or gable roof usually requires tricky cuts and notching. Sidestep these problems by using the rafters in the existing roof as a pattern for cuts and notches.

Roofs are traditionally sheathed with ¾″ tongue-and-groove boards. Get a roof equally strong and save on labor costs by sheathing it with ⅜″ plywood. The big panels go on much faster.

The pitch of your roof—the number of inches it rises in each horizontal foot—may determine what kind of roofing you can use. You can't use slate on a pitch of less than 6″ in 12″, asphalt singles on a pitch of less than 2″ in 12″, with special cementing required under 4″ in 12″. On flat or nearly flat roofs, you can use little except roll or built-up roofing. Allow for this if you want your new roof to match the existing one.

Install flashing where your new roof meets the house, and above windows and doors. Aluminum, in most cases, is as satisfactory as copper and much less expensive. Where soldering of flashing is required, as on chimneys, choose copper. Caulk all cracks and joints so that the addition won't leak away the dollars you spend on fuel.

Exterior finish. Keep it simple. Don't think you have to make it different for "variety." The result may be a hodgepodge.

The most weather-resistant woods for exterior use are redwood, cedar and cypress, although you can use less expensive siding if you plan to paint it. Use aluminum nails and you'll never be bothered by "weeping," an occasional failing even of galvanized nails, especially in damp or rainy climates.

Insulation. Don't skimp on it. Some builders are now putting as much as 6″ between roof rafters and are packing side walls with full 3″-thick batts. The reason:

In just
10 minutes
your dealer
can prove...

The AMF De Walt® Power Shop makes woodworking easy for you

SEE Safer, easier top-side cutting

SEE Direct-drive power, no belts, no pulleys

SEE De Walt's exclusive safety features

SEE Layout marks visible every cut, no mistakes

SEE Work moves straight—saves 75% floor space

SEE De Walt becomes 12 professional tools in 3

See for yourself why De Walt's original radial arm design, big capacity, and unsurpassed accuracy make it the finest, most valuable all-purpose power tool you can own.

Your dealer will quickly show you how a De Walt saves the cost of a shop full of tools — makes all home woodworking fast, easy, safe . . . fun! How you can make furniture, build in cabinets, finish off the attic or basement, make home repairs . . . do all those things you've always wanted, *even if you've never used a power tool before!*

See your Franchised De Walt Dealer for a Free, *convincing* demonstration today! Easi-Budget Terms — 10% down, 2 years to pay!

Owners! Send for valuable new De Walt Woodworking Manual, just $3.95 pp.

Send the coupon for free booklet and name of nearest De Walt dealer.

Another AMF Product
DE WALT POWER TOOLS

De Walt Inc., Dept. PS-709, Lancaster, Pennsylvania
Subsidiary of AMERICAN MACHINE & FOUNDRY COMPANY

☐ Send FREE colorful 20-page Booklet and name of dealer.
☐ I enclose $3.95 (check or m.o.) for De Walt woodworking manual.

Name _____
Address _____
City _____ Zone _____ State _____

Heavy insulation not only saves winter fuel but is a particularly critical factor in summer cooling. It costs five times as much to cool your house one degree as it does to heat it one degree. Batts with aluminum-foil facing are expensive—but pay off.

If your addition has a finish ceiling, insulate the ceiling, not the roof. Ventilate between ceiling and roof, as you would any unused attic. To secure an air wash between rafters, include small louvers or screened openings in the underside of the roof overhang.

If the addition is next to an unheated area, such as a garage, don't overlook insulating these walls. If they are closed, take off a top board and pour in pellet-type insulation.

Interior finish. Apply finish only after all plumbing, heating and wiring have been done. If your electrical circuits are already overloaded, get increased current by enlarging the size of the service entry. Typical charge for converting from a 60- to a 100-ampere service ranges from $75 to $150.

Most economical wall finish is gypsum board—five to six cents per square foot. It's good, too—so good it's going into many luxury homes. New techniques make it easier to get invisible joints. If you find your own joint technique still off, use sand- or texture-paint to hide imperfections.

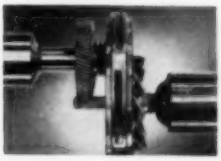
Don't overlook the handsome new wall-paneling materials available. They are worth inspection at your lumber dealer. Of special note are prefinished hardwood panels in sheet and plank patterns. Price: about 50 to 80 cents per square foot. But they are beauties. END

JALOUSIE FRAMES went up in one piece on the Ponds' new addition. Glass slats were then inserted in metal clips that pivot like Venetian blinds. Frames also hold screens, storm sash.

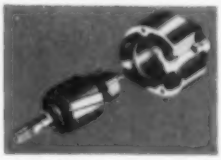
Black & Decker® U-3

—packs more power—does more jobs!

GEARED CHUCK same as used by industry for extra holding power and accuracy.



HIGH-QUALITY HELICAL GEARS give quieter, smoother flow of power from motor.



FAMOUS B&D-BUILT MOTOR has 45% more power, 100% greater torque (turning force).

SLIM, TRIM HANDLE is shaped to fit the hand for better control. Bright, highly polished housing stays new looking.

Insist on Black & Decker's **U-3** —the ¼" drill with the quality difference

3-WIRE CABLE has industrial-type ground wire for extra safety in operation.

Look for the 3-prong plug

Power pays off when you drive B&D attachments

- **Trims hedges**
- **Saws wood**
- **Drives screws**
- **Sands any surface**
- **Polishes any material...and DRILLS!**

Most drills can bore holes without trouble. But driving attachments really separates the tools from the toys. That's why we gave the Black & Decker U-3 Drill extra power, extra torque, extra quality. Insist on the U-3 Drill and B&D attachments by name at your dealer's —don't accept less than the best!

Find Your B&D Dealer in the Yellow Pages

Look under "Tools-Electric"

Black & Decker

World's largest maker of Portable Electric Tools

SEND COUPON FOR HANDY IDEA BOOK!

THE BLACK & DECKER MFG. CO.
Dept. 5097, Towson 4, Md.

Please send me a copy of your "Handy Tips" booklet. I enclose 25c to cover cost of handling and mailing.

Name .....

Address .....

City ..... State .....

6 Locations for That Extra Bath

NO ROOM for an extra bathroom? It's a rare home where this is really the case. A bathroom can be squeezed into an amazingly small space. An area 3′ by 5′ handles a wash basin and toilet; 3′ by 8′ is enough for a shower, too.

Look for the space in places like:

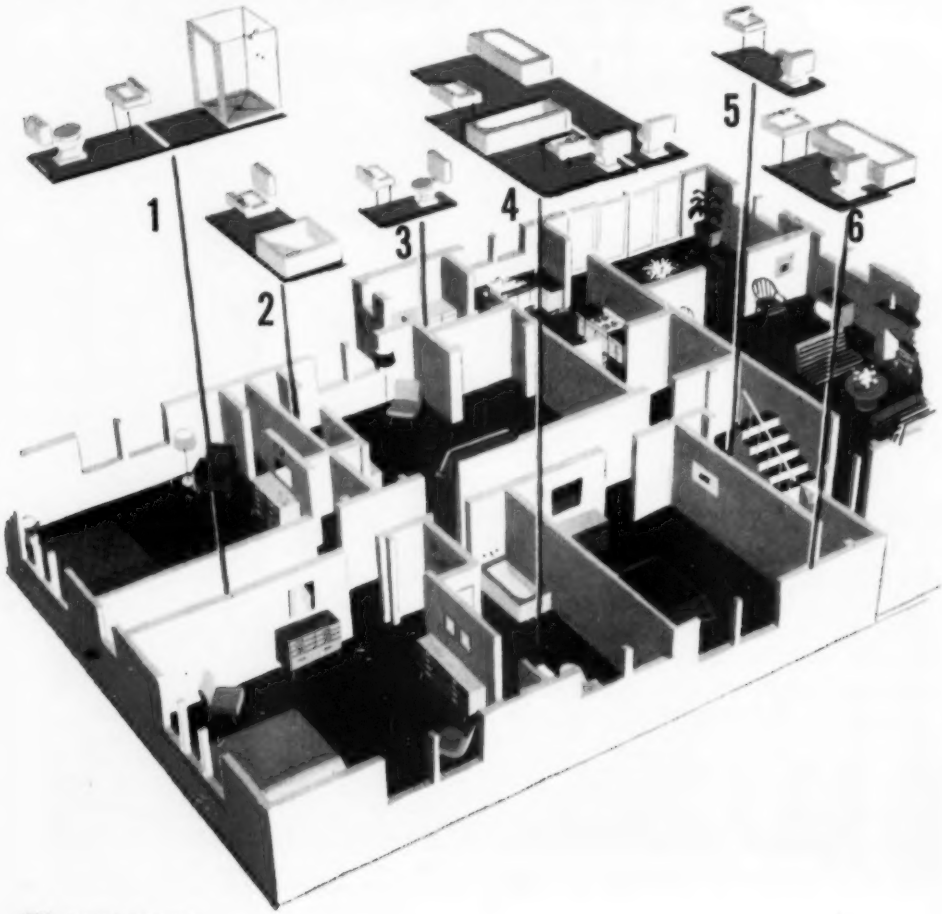
1. A hallway. The untraveled end of a hall, next to a window, may contain as much as 30 or 40 square feet—adequate space for a bathroom.

2. Closets back-to-back. Opened up, they sometimes measure as much as 4′ by 4′. A walk-in closet might become a powder room by itself.

3. A first-floor laundry. Streamline the laundry with modern appliances that take up less room, like a dryer-over-washer combination. Then add a half bath.

4. An existing bath. An average basin, bowl and bathtub need a minimum of 5′ by 6′. Some large bathrooms can be split into two by relocating the fixtures.

5. Under the stairs. A wash basin



TRADE NOW!

$1.00 allowance for your old torch...

ANY OLD TORCH—Gasoline, Butane, Kerosene, "Tin-Can" Type, Alcohol, Propane—regardless of age or condition

...toward a modern, convenient

BERNZ-O-MATIC®

TX-888 All-Purpose

TORCH KIT

Here's the kit you'll use hundreds of times—for home and auto repairs, hobbies, starting charcoal fires, laying asphalt tile, electrical work, etc. Easy to use. Torch lights with flick of a match. Plenty of heat. Up to 2,300° F.! Safe, disposable fuel cylinder that provides up to 15 hours of use.

Regular retail kit price	$8.88
LESS YOUR TRADE-IN	$1.00
NOW YOU PAY ONLY	$7.88

HUNDREDS OF USES:

- Sweating copper tubing
- Plumbing repairs
- Leading gutters

- Laying tile
- Lighting fires
- Removing paint

- Burning weeds
- Soldering
- Loosening frozen bolts

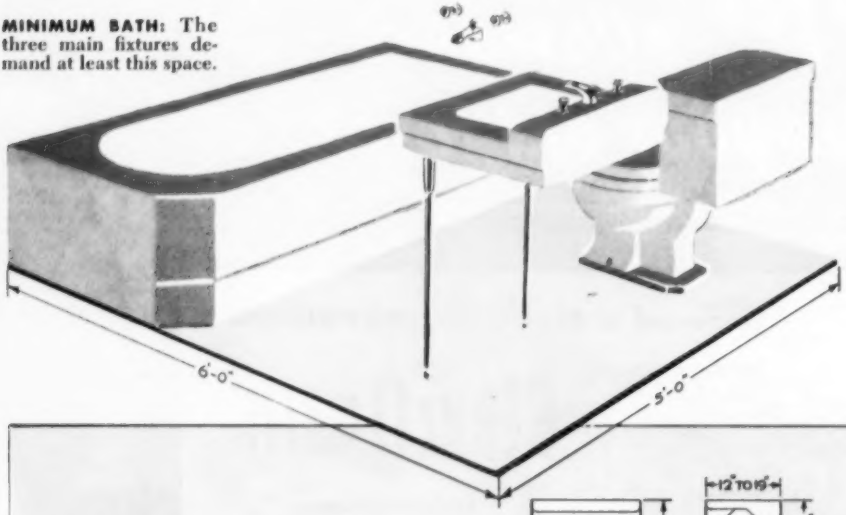
OTTO BERNZ CO., INC. • ROCHESTER, N.Y.

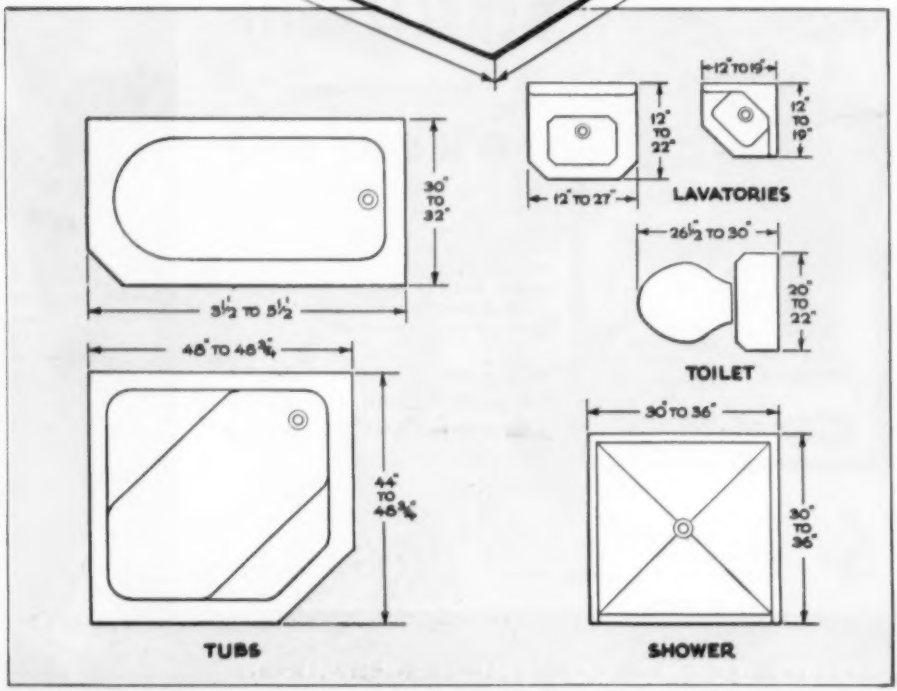
and toilet usually will fit here. Just remember to check the headroom before you go ahead with the installation.

6. Part of a bedroom. Take a 3′ slice from one side of the room. Put a toilet at one end of the new room, a stall shower at the other and a basin opposite a door in the partition.

Other tips. Have the door swing out, or install a sliding one. Ventilate windowless rooms with a ducted fan or prefabbed skylight. Place new fixtures near existing water and waste lines for a lower plumbing bill. Check floor joists: Conventional fixtures weigh up to 20 lb. per sq. ft., tile in mortar up to 30 lb. On spans over 11½′, better double 2″-by-8″ joists on 16″ centers.

MINIMUM BATH: The three main fixtures demand at least this space.





PLAN YOUR OWN BATH by using these standard fixture dimensions. Allow adequate clearance around them—3″ to 4″ of arm room on each side, at least 24″ between fixtures.

now, in power tools, too,

if it's Remington, it's right!

MODEL 149B. *¼-inch drill; AC-DC 25 to 60 cycle; 115 volts; 2500 rpm. free speed; 1500 rpm. load speed; 3 lbs.; U.L. approved.*

Here's the answer to the tough ones—the jobs that defy ordinary drills! Yes, now you can have power tools by Remington, the newest name in power tools...the greatest name in sporting firearms and ammunition for 141 years.

Model 149B has the power of drills costing twice as much! And it's built for superior performance on the most rugged jobs—as are *all* of Remington's famous Mall power tools.

With its attachments, this drill can be used as a saw, planer, sander, polisher, paint mixer, hedge trimmer, screw driver, and in many other ways. Saves hours of work.

There's a power tool by Mall Tool Company, Division of Remington Arms Company, Inc., for every need. For further information just fill out the convenient coupon.

Remington Mall®

MALL TOOL COMPANY
Division of Remington Arms Company, Inc.
Bridgeport, 2, Conn.

Electric Saws for every carpentry job.

Belt and Orbital type sanders.

**Prices and specifications subject to change without notice.*

MALL TOOL COMPANY, Division of Remington Arms Company, Inc. Dept. 17
Bridgeport 2, Conn.
Please send free catalog on Portable Electric Tools.

NAME _____

STREET _____

CITY _____ ZONE ____ STATE _____

How to Move a Porch Indoors

A roof and foundation put you well on the way to a permanent enclosure. Add walls and the job is done

TAKE a fresh look at an open porch and you'll see that it represents the two most expensive parts of an addition to your house: a floor and a roof. You need only three walls to make it a permanent room.

Modern building materials give you a broad choice of attractive enclosures. For permanent walls, you can use conventional stud construction. The method is the same whether you fit screens in between the studs or nail up large building panels over them. Spacing isn't critical because the studs support no weight—you can locate them to match whatever materials you use.

For a winter enclosure, you may prefer an insulated wall, using standard batts that fit between studs either 16″ or 24″ apart.

Mr. and Mrs. Henry Weiman chose a modern material—aluminum—for the convertible enclosure on their home in Norwalk, Conn. Screens and louvers keep out bugs and rain in summer; glass seals out the cold in winter. Louvers, screens and glass frames are made of aluminum, following Reynolds Metal Co. plans.

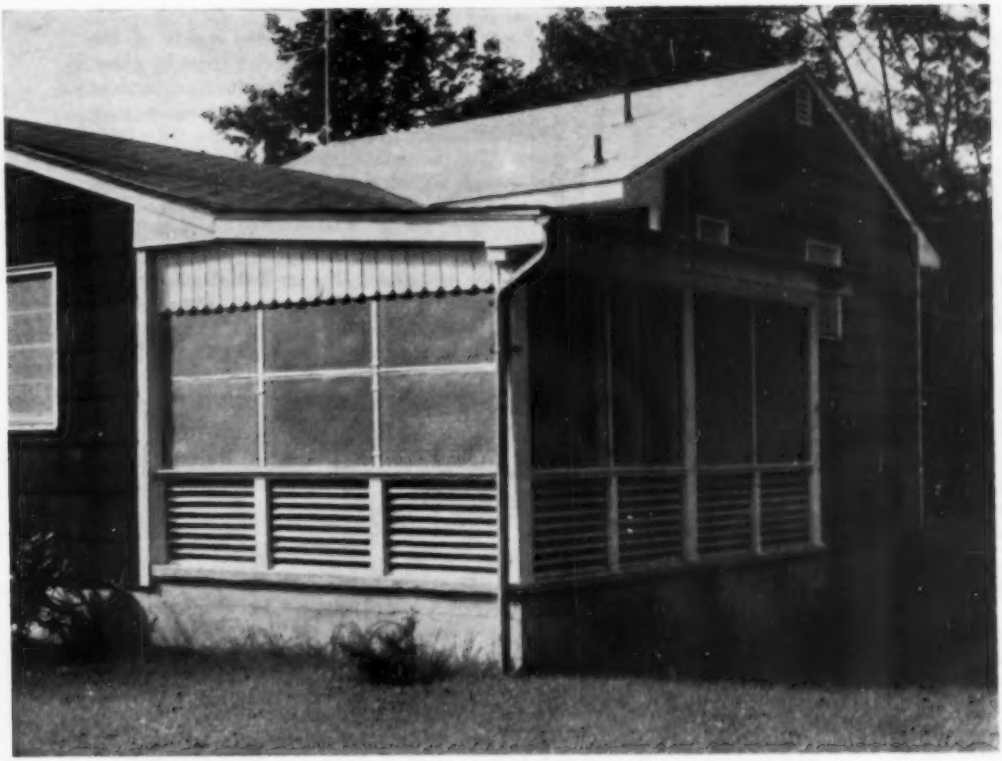
Two-by-four studs were first put up to divide the sides of the Weimans' porch into equal sections. Short sections of louvers were then fitted between the studs to provide a low knee wall. The louvers, cut from sheet aluminum, can be made in widths up to 36″ and stacked to any height. Their ends are held in frames made of 1″ aluminum angle.

To avoid trouble later, the studs are anchored directly to the concrete with metal angles and screws. This eliminates a wood sole plate that might eventually rot from water dripping off the louvers. Flashing riveted to each bottom louver carries water off over the edge of the porch.

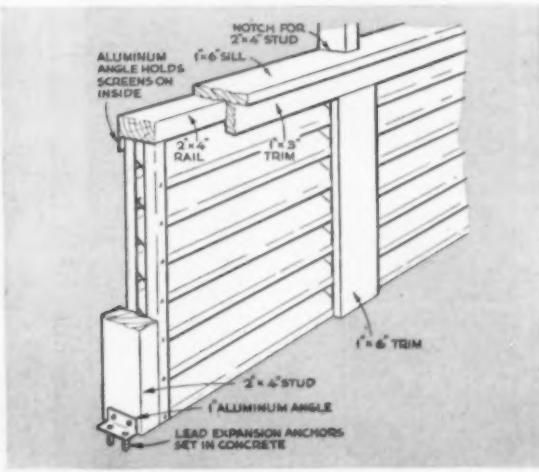
The tops of the studs are spiked to the porch header along the front where the roof line is straight. Along the sloping sides, a level two-by-four is run from the house wall to each corner post to provide a horizontal header, and the studs are nailed to the underside. The opening above the header is filled in with decorative boards cut to match the roof slope so that their bottom edges are horizontal.

Over each set of louvers a two-by-four rail is spiked between the studs, and a one-by-six sill board is nailed on top. Screens

ALUMINUM LOUVERS were used on the Weimans' porch to give effect of a partial wall without blocking cool breezes in summer. Sill above the louvers is sloped slightly to shed rain.



GONE ARE THE COLD, RAIN AND BUGS that made the old open porch unlivable much of the time for Mr. and Mrs. Henry Weiman of Norwalk, Conn. Closed in with interchangeable screens in summer and storm sash in winter, the porch now becomes a useful family room all year 'round.



HOW LOUVERS FIT BETWEEN STUDS is shown in drawing above. They're made by cutting sheet aluminum into slats and riveting the ends to frames of aluminum angle. At right, screens can be made to any size to fit openings above the louvers. Screens, storm sash and louvers are made from Reynolds Metals Co. plans available at hardware stores and lumberyards.

WILL YOUR NEW HOME HAVE A USEFUL BASEMENT?

Plan the basement of your new home for a future rumpus room, workshop, storage area

The key to it is *direct* access with a permanent, neat looking, weathertight Bilco Door. Rugged steel construction assures lifetime service. Exclusive built-in springs afford effortless operation. The most useful, most practical door in the entire house.

Look into new Bilco Stair Stringers, too. It's the faster, more economical way to build a sturdy good looking stair under your Bilco Door. See your lumber and building supply dealer or return coupon on opposite page for complete information.

Bilco®

AMERICA'S FINEST BASEMENT DOOR

Sold by all leading lumber and building supply dealers.

are held in tracks on the inside of the louvers and are replaced in winter by glass. For greater warmth and protection against breakage, plywood panels could be substituted for the glass.

The screens above the louvers fit between the studs and go on from the outside, up against quarter-round molding used as stops. Identical glass panels are put in similarly in winter, and both are held in place by metal turnbuttons. Double storm sash could be installed by putting additional glass panels on from the inside, against a second set of stops.

A DETAIL WORTH NOTING: Metal angles and expansion anchors were used to fasten studs to the concrete floor of the Weimans' porch. This means there'll be no wood plate to rot.

AFTER STUDS WERE UP, a two-by-four rail was nailed between them about 30" high to form openings for the Weimans' louvers. Tops of studs butt against a level two-by-four header.

Dividing each sash into two sections, as was done on the sides of the Weiman porch, makes them easier to handle and store than the full-length ones in front. But in deciding where to divide them, care must be taken to avoid a view-obstructing line that falls at eye level when either standing or sitting.

The Weimans figure they spent about $80 for lumber and a door to enclose their 8′-by-14′ porch. Louvers cost $60. A full set of screen sections ran to about $60, and an identical set of glass sash $95. That's a year-'round room for $295.

TO GET A SNUG FIT against the shingles on the Weiman job, stud was spiked to house, then faced with a notched trim board. Drawing compass transfers outline of shingles to board.

SHIPLAP SIDING was used to fill the space between the screens and the sloping roof. The lower edges, cut to decorative scallops, hang several inches below top of the screens. END

REPLACE YOUR OLD CELLAR DOOR—YOURSELF!

Now you can replace that worn out troublesome wood hatchway with a trim looking all steel Bilco Door. Do it yourself easily, quickly. Adds amazing new beauty to your home. Permanently eliminates repair and replacement expense. Its smooth, easy operation will delight the whole family.

Three standard sizes fit almost all existing stair wells. *Rush coupon today for free "How To Install It" folder with instructions for measuring.*

Bilco®

THE BILCO COMPANY
DEPT. 961
NEW HAVEN, CONN.

AMERICA'S FINEST BASEMENT DOOR

Please send complete information and the name of my nearest dealer.
☐ I am interested for a new home. ☐ I wish to replace my wood hatchway.

NAME .....

ADDRESS .....

CITY ..... STATE .....

Divide—and Conquer Your Space Problem

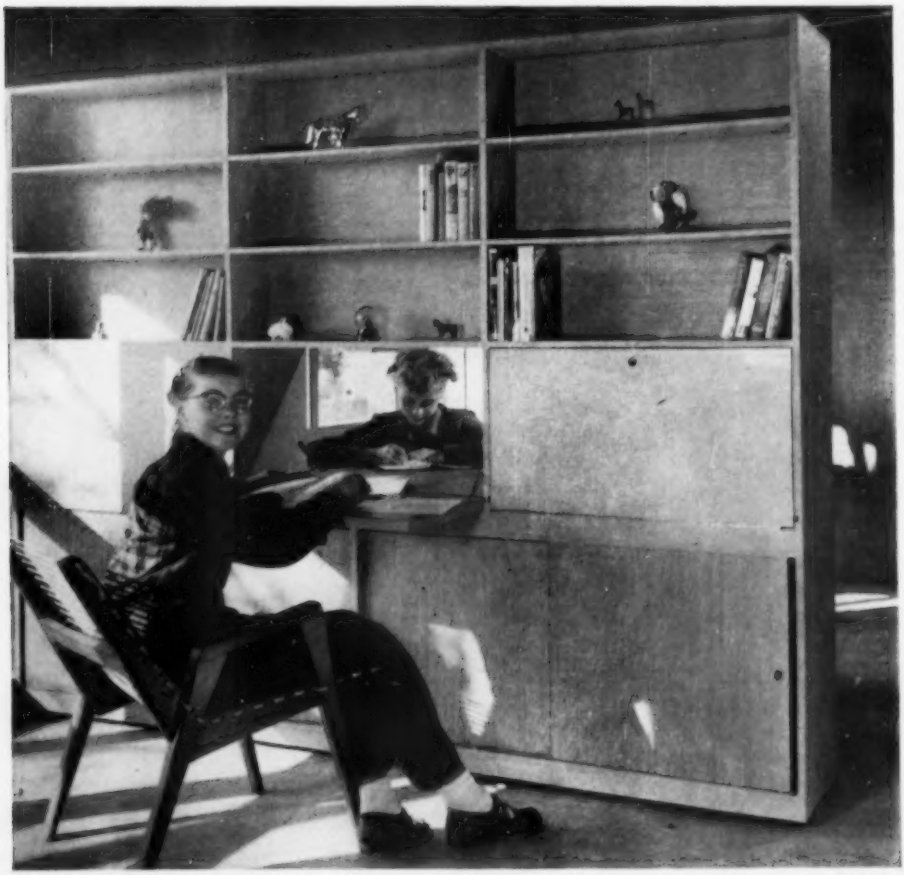
Need another dining area or bedroom? Room dividers can double the use of your space

OFTEN it's not more floor area you need, but a better way to use what's already there. By adding a divider that splits one room into two handier spaces, you can double the room's convenience.

Every room in your house is a possible candidate for a room divider.

- In the kitchen: add a laundry space or a breakfast nook.
- In the living room: add a dining area, library or a TV corner.
- In a bedroom: turn one room into two.

Your divider may only suggest separa-



ONE BEDROOM BECAME TWO with this divider built by Darrell Huff of California. Shelves, cabinets and drop-down desks are accessible from both sides, with a center "pass-through."

if you need Quality Performance

. . . THIS IS THE SAW FOR YOU!

CLAUSING

10" TILT/ARBOR SAW

Whatever your sawing requirements . . . construction, cabinet work, industrial or hobby . . . this new Clausing will give you performance surpassing anything you've ever experienced in saws of comparable size. It is the only saw to give you the important features listed below . . . the saw to consider before buying *any* saw. Get the facts and compare!

UP TO 3 H.P. MOTOR

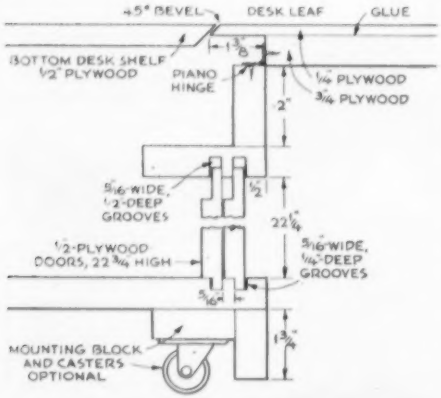
Only CLAUSING gives you all these important features:

- ★ Heavy-duty, 3 HP construction throughout
- ★ Three big table sizes . . . up to 54¾" x 27½" . . . handles big stock with ease
- ★ ¾" diameter arbor
- ★ Sealed-for-life ball bearings
- ★ Continuous-duty motors . . . 1 to 3 HP
- ★ Double-locking lift-off fence . . . best in the industry
- ★ Modified-wedge cog belt drive
- ★ Big, efficient blade controls
- ★ Large mitre gauge with keyed slide
- ★ Exclusive tilt dial
- ★ Cast-Iron base

WRITE FOR FREE LITERATURE

CLAUSING DIVISION
Atlas Press Company
9-124 N. PITCHER STREET KALAMAZOO, MICHIGAN

DESK LEAVES OPEN LEVEL on the Huff divider because of beveled lip, as shown in sketch below. Lip is formed by gluing extra ¼" thickness of plywood to top of ¾" plywood.



SLIDING DOORS are rabbeted extra deep at top so they can be removed or inserted by pushing them upward to free lower edges. Casters are concealed by skirt almost touching floor.

tion, such as a waist-high counter for serving food to an adjoining dining area. Often a set of vertical poles will give the effect of a divider without closing off light and air. You can make brackets to hold the poles by drilling matching holes in wood strips and fastening the strips to the floor and ceiling.

A divider is also an ideal spot to mount a TV set on a swivel. Then you can let part of the family watch while others want to talk in another area.

By building your divider as a storage unit, you can gain an entire wall of shelf and cabinet space while stealing only a foot or so of floor space. A divider can also add a decorative touch. Plants, fish tanks and light fixtures have all been used to dress them up.

Where only partial privacy is needed, run the divider 1′ or 2′ short of the ceiling. The open space at the top will keep the new smaller areas from looking closed-in. For complete privacy, you may prefer a full floor-to-ceiling unit.

Two bedrooms from one. One couple with two children in the same bedroom used a double-decker bunk bed—itself a space saver—to create two separate bedrooms. They nailed a plywood panel to one side of the bed between the floor and the upper bunk. Then, on the opposite side, they nailed another plywood panel between the upper bunk and the ceiling.

A door hinged at the end of the bed completed the new "wall." Now the youngsters share a single bed—but in different rooms. Reconverting to one room later will be simple.

Wheeled dividers go anywhere. Darrell Huff of Sonoma, Calif., built a portable storage wall mounted on casters. Already it has served to divide one big office into two, a garage into a workshop and den, and his two daughters' bedroom into separate sleeping areas.

The sides, shelves and uprights in the divider are all 16"-wide strips of plywood (three widths sliced from each 4′-by-8′ plywood panel). Hinged desk leaves drop down on each side, and sliding-door cabinets are arranged so that half open from one side, half from the other.

The Huff divider leaves an open space at the ceiling. When a fully closed partition is wanted, he just fits in small pieces of plywood at the top and hinges a door at one end of the divider. END

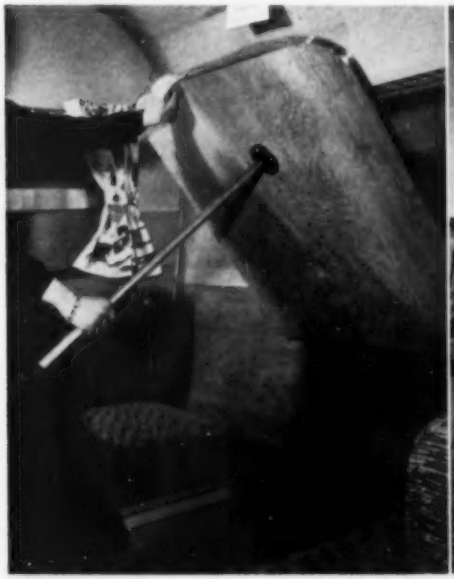
Ideas You Can Borrow from House Trailers

Space savers designed for mobile living will solve many small-house problems, too

YOUR home may seem like cramped quarters, but many trailer families squeeze into a space from a half to a quarter as big. Less than 400 square feet of floor area may give them three separate bedrooms, a living room, kitchen-dining room, and full bath. Ingenious furnishings do the trick—sliding doors, folding walls, shallow floor-to-ceiling cabinets, foldaways, pull-outs, and dual-purpose furniture.

While some of these trailer features involve more inconvenience than the average homeowner would put up with, you can profit by borrowing other ideas, to make the most of your own house space.

PULL-OUT TABLE that operates on the principle of a roll-top desk is the biggest space saver in this trailer kitchen. You'd find one like it just as handy to "enlarge" a cramped dinette.

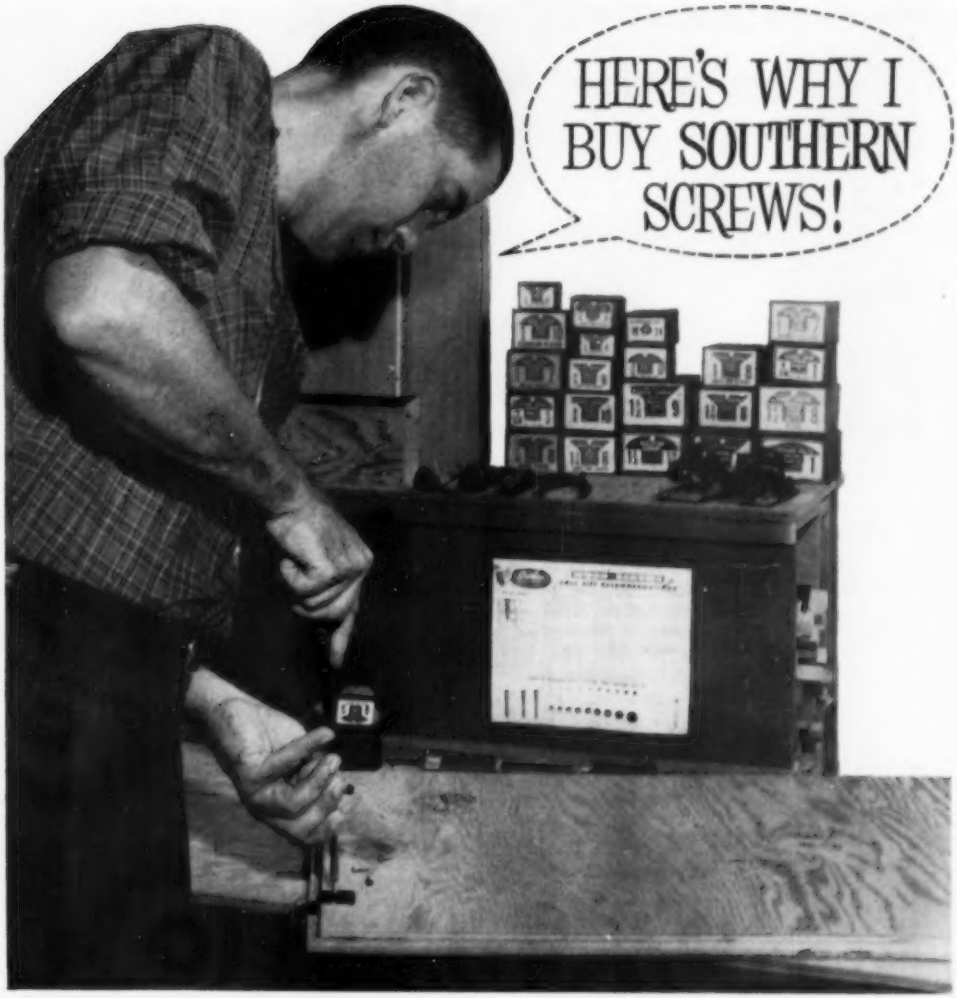


FOLDAWAYS are as old as ships' cabins, but trailer manufacturers make the most of them. A table, work shelf, vanity, bunk or lavatory hinged to a wall takes little or no floor space when not in use. Similar foldaways will go far to solve your own space problems. [CONTINUED]

Trailer tricks make space do double duty. Try some at home

WORK-COUNTER SPACE is increased when removable covers are fitted to both sink and stove. The sink hatch shown above comes in two sections that rest on a ledge. For the stove, a metal-bottomed lid hinges down from the wall to safely cover the burners and the pilot light.

DUAL-PURPOSE FURNITURE for trailers includes sofas that convert into double beds, and facing dinette seats that make up, sleeping-car fashion, into beds at night. Storage space may be cabinets placed high enough for head clearance, or spacious seat boxes with cushion tops. END



I want *Quality screws made in the USA.* Southern makes every screw it sells. Makes them to rigid specifications. They start easy, go straight, and hold fast!

Southern provides the exact size and finish I want. Either Phillips or slotted, in all popular head styles and finishes. Steel, brass, silicon bronze, aluminum and stainless steel in standard plated finishes.

Southern Screws are easy to find. Dealers stock them because they are pre-sold through national advertising and widely distributed for quick shipment.

Southern's "EZ-to-C"© label prevents confusion. I know at a glance which box has the fastener I want. It's easy to build up a working supply to meet all my needs, and keep them straight. No fighting traffic, no parking worries, for "driblet" purchases.

I buy by the box and save money!

WOOD SCREWS • MACHINE SCREWS & NUTS • A, B & F
TAPPING SCREWS • DOWEL SCREWS • DRIVE SCREWS
STOVE BOLTS • CARRIAGE BOLTS • HANGER BOLTS

Mail coupon for your helpful TC-4 folder and Popular Science reprint, both FREE.

Southern Screw Company
Box 1360PS-7
Statesville, North Carolina

Southern SCREW COMPANY

Send Free TC-4 "Selecting and Using Wood Screws and Sheet Metal Screws," my copy of "10 Million Screws a Day," reprint of **Popular Science** story

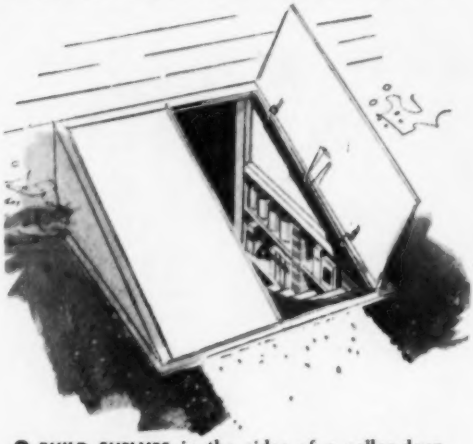
NAME .....

ADDRESS .....

CITY ..... STATE .....

4 Space-Making Ideas for Your Home

1 ON A WALL ABOVE A SOFA, usually bare, hang one or more wood shelves on brackets attached to the studs. You'll save the floor space that a full-length bookcase would take up.



2 BUILD SHELVES in the sides of a cellar-door hatchway, cutting back some earth if necessary. Paints, turps, lawn chemicals and similar supplies are safer outdoors than in.

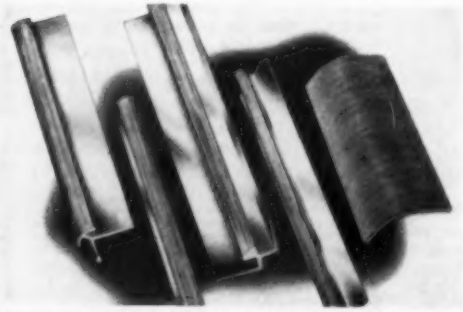
3 A KITCHEN DOOR often swings to within 3" of a blank wall—the amount the knob projects. Steal an extra inch—so that the door doesn't quite swing back all the way—and build easy-to-reach ceiling-high pantry shelves 4" deep to hold canned foods. Arrange the shelves so that the knob fits into a space between.

4 BATHROOM SPACE IS WASTED above fixtures and at the top of tubs and shower stalls. Cabinets attached to the wall and ceiling will hold towels, linens and other supplies. Ceiling cabinets can often be installed in other areas, such as over doorways and in corners, without being in the way or obstructing headroom.

BRIGHTEN ANY ROOM with luxurious Weldwood Paneling. This cheerful birch V-plank paneling gives a random-plank effect, yet comes in 4' x 8' sheets that are prefinished to save you hours of labor . . . and costs only $65 for a full 12' x 8' wall.

Make an old room new again with easy-to-install Weldwood paneling

INSTALL PANELS with nails concealed in V-grooves, or with Weldwood Contact Cement, on furring strips over studs, or over old walls. Bonds permanently, on contact, without clamps.



EMPHASIZE JOINTS with Weldwood Veneer-Faced Aluminum Moldings to match panel wood. Also available: Weldwood Hardwood Trim, in a variety of woods and styles.

You can enrich a room with wood paneling easily and less expensively than you may think.

Weldwood Prefinished Paneling comes in a handsome variety of woods and finishes, all ready to install. Each panel is factory sanded, waxed, and rubbed like fine furniture to bring out the true wood beauty and protect its surface. Or, you may buy Weldwood Paneling unfinished at lower cost.

Weldwood Paneling's beauty grows as time goes on . . . and with hardly any care. It's guaranteed for the life of your home! See Weldwood Paneling at your lumber dealer's, or at any of our 87 offices.

Weldwood®
PANELING

A Product of United States Plywood Corporation

Weldwood Glues—Flexible Wood-Trim®—Firzite®—Satinlac®

United States Plywood Corporation
Box 61, New York 46, N. Y. PS 9-57

☐ Send me the name of my nearest Weldwood dealer.

☐ Please send me a copy of the full-color, 20-page decorating book, "Beautify Your Home with Weldwood Paneling." I enclose 10¢.

NAME.....

STREET.....

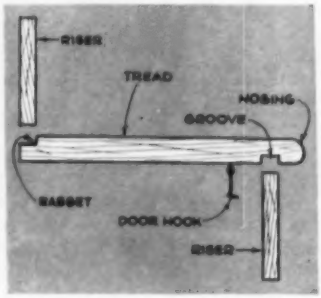
CITY.....STATE.....

Removable Steps Solve Space Problem

STRAIGHTAWAY ACCESS is a must for moving bulky objects up and down narrow stairs. The Ron Andersons got it in an ingenious way after finding they couldn't heft furniture past a right-angle turn at the foot of a stairway in their Minneapolis home. They installed treads and risers that hook to the side runners for easy removal. It's then possible to convert the stair well into an open hatchway, reached (as seen above) from an aligned back door and cellar stairs. Foam-rubber strips on the runners damp tread sound.

SCREEN-DOOR HOOKS attach the stair members firmly to side runners. The runners are extra thick (1½") to provide good bearing surfaces. Foam-rubber strips offer locking tension for the hooks.

RABBET AT REAR and groove under the forward end of each 1"-thick oak tread act as interlocks for risers. As shown in the photo at left, the topmost riser is permanently attached to the side runners.



It's easy to build a sound-conditioned game room like this!

Here's a game room where the kids (and you) can raise a rumpus without rousing the whole house and neighborhood. And you can build a room like this in your basement for much less than you might think.

Gold Bond Acoustamatic Ceiling Tiles can be stapled—or nailed—easily to wood furring strips applied right on your old ceiling. Both random and regular patterns (see above) have hundreds of perforations that soak up noise. You have a quiet room, and the ivory-white, flame-resistant finish makes the room bright and cheery.

The attractive walls are of Gold Bond Gypsum Wallboard and Insulation Tiles. Tiles come in ivory-white and a random assortment of four lovely pastels. Interlocking edges hide nails or staples. Wallboard goes up fast. Saw panels like wood, or score with a knife, and snap. Finish with quick-drying Gold Bond Velvet Latex Paint and matching Latex Enamel. Move in!

Want plans so you can start building? Write for free illustrated folder, "How to Remodel Your Basement," to National Gypsum Company, Dept. PS 97, Box 73, Buffalo 13, N. Y. Then see your local Gold Bond® Dealer. He'll supply everything you need – including helpful advice.

Gold Bond

BUILDING PRODUCTS

NATIONAL GYPSUM COMPANY

OPERATION Better Your Home HOME IMPROVEMENT

Scrap Forms Speaker Grille

ATTRACTIVE grille trim for a homemade speaker enclosure may be no farther away than your scrap bin and your wife's "junk jewelry" box. Umbrella ribs, or metal binding strips from calendars can be woven into many patterns. Solder rosettes at intersections, if you like; then gild.—*Carlton G. Bucher, White Plains, N.Y.*

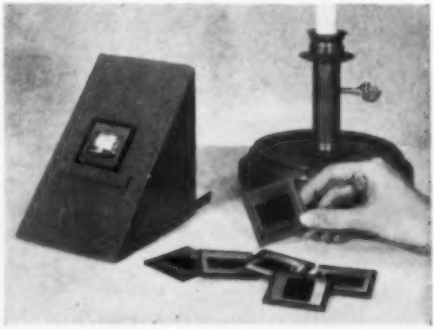
Radiator Hose Patches Pipe

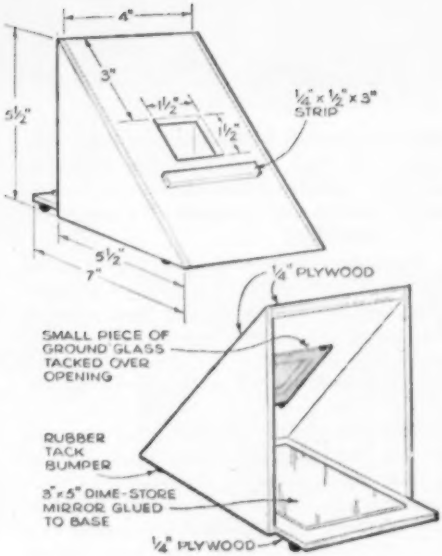
YOU don't have to own a pipe threader to replace a short length of leaking water pipe at a distance from a union. Cut out the defective section with a hacksaw and make a coupling from radiator hose, as shown above. Such hose comes in sizes to fit most home water pipes, and if slightly oversize it can be drawn tight when you fasten the hose clamps. A hose coupling is also handy on horizontal drain pipes that have to be parted periodically for cleaning.—*Louis M. Reitz, Bourbon, Mo.*

Mirror Lights Up Color Slides

THE viewer below will give you a quick look at your 35-mm. color slides when you don't have the time or opportunity to set up a projector. It needs no batteries or light bulb, yet produces a surprisingly bright image that several persons can see at one time.

The secret is a small dime-store mirror. Cemented to the base, it reflects light from a window or a table lamp up through a piece of ground glass to illuminate the transparency. You can make the sides and base from 1/4" plywood or other light wood. For 2"-by-2" slides, make the center hole and ground glass correspondingly larger. The ground glass is available in precut sizes from photo-supply stores.—*Eric R. Adams, Toronto, Ont.*





I'm so glad you did it ... with

DANBURY

Rubber Tile

PLASTIC-FORTIFIED

And you'll be delighted, too, if you bring the color and comfort of Danbury Rubber Tile into your home. It's luxury flooring (surprisingly low in price).

write FOR THE DANBURY FLOOR PATTERN PLANNER AND INSTALLATION GUIDE

It's free!

FLOORING DIVISION

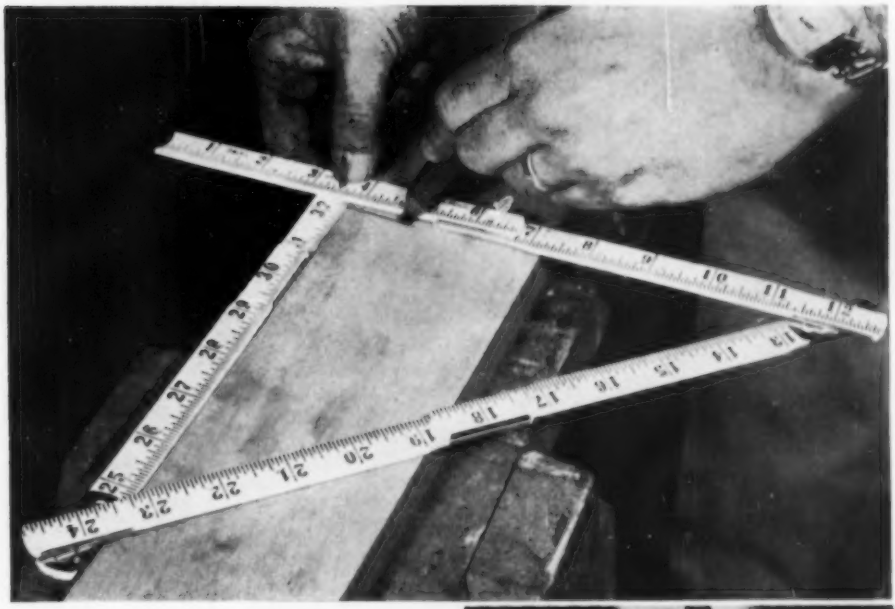
THE DANBURY RUBBER COMPANY, INC.

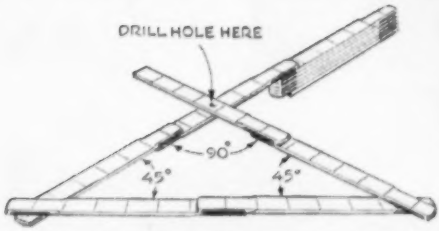
DANBURY, CONNECTICUT

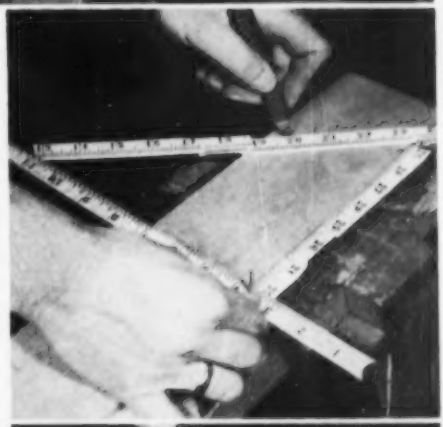
Folding Rule Is 7 Bonus Tools

A SIX-FOOT folding rule will do a lot more than just measure distances. You can use it as a vertical level, a try square, miter gauge, marking gauge, compass, protractor and template. To make it serve all these purposes, extend the first blade of the rule. Butting the rest of the rule against the edge of a board (see lower sketch, opposite page), note the distance between this edge and the 5″ mark (on my rule it is $\frac{3}{16}$″). At exactly this distance beyond the 1″ mark, bore a $\frac{3}{32}$″-diameter hole through the rule at its center line. Continue boring holes at 1″ intervals the full length of the rule. Also open it at the 12″ and 24″ joints to form an accurate 45° right triangle. Bore aligned holes through the two blades that cross at 90° (see upper sketch, opposite page). The photos show how the rule is then put to use as seven bonus tools. —*Philip E. McCafferty*

VERTICAL LEVEL: Extend the rule about halfway and suspend it from a nail at the 1″ hole. Hanging free, the heavy folded section holds the rule plumb for vertical aligning.

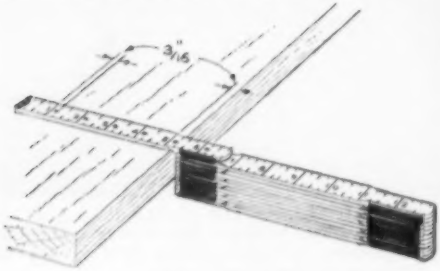




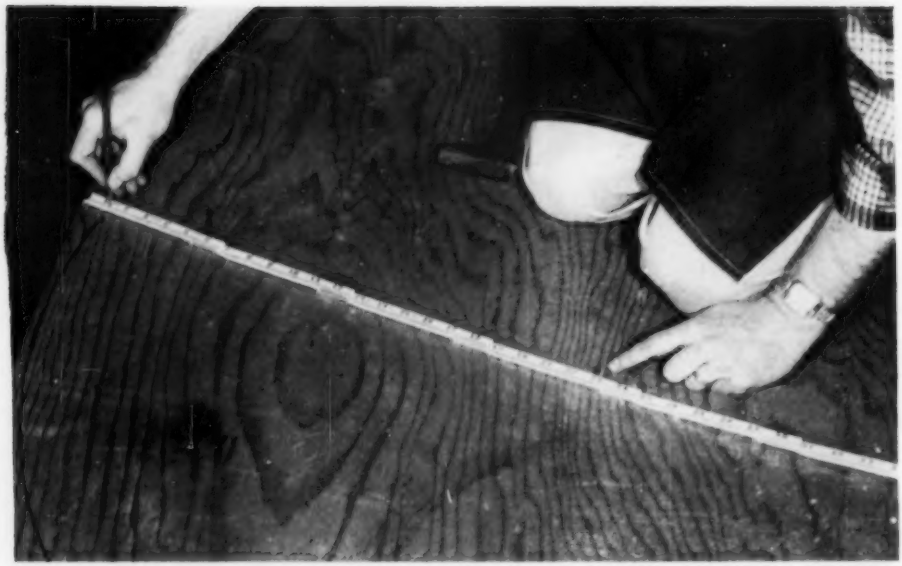


TRY SQUARE AND MITER GAUGE: Open the rule at the 12″ and 24″ joints, form a 45° right triangle, and drill aligned holes through the centers of the crossing blades. This gives you a try square or miter gauge at a moment's notice. Just slip a nail through the holes and use whichever side of the rule provides a blade that can be butted against the stock.

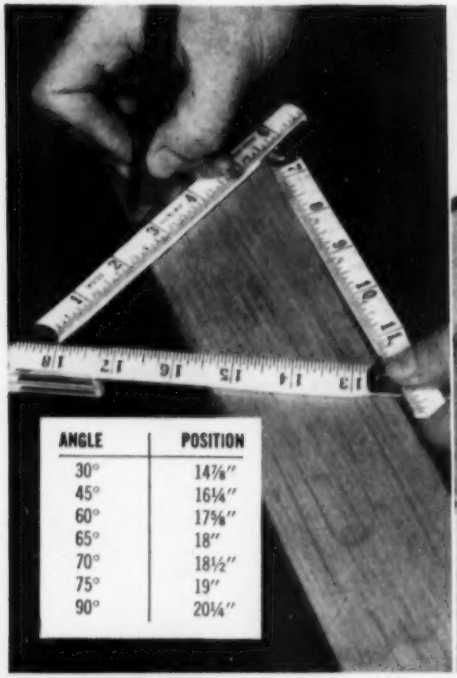
MARKING GAUGE: Holes drilled at 1″ intervals make the rule a handy marking gauge. Using the same method, you can transfer irregular outlines to the surface of any material.



Please turn the page for more bonus uses for your rule

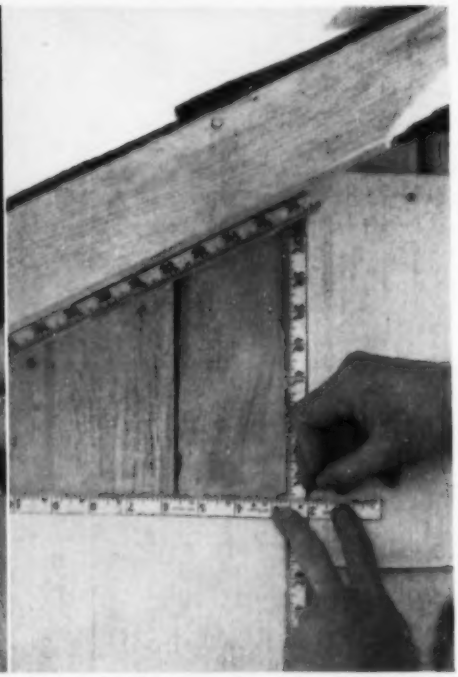


COMPASS: With a nail for a pivot, the rule is turned into a king-size compass that lets you draw circles with diameters ranging from 2′ to nearly 12′. Deduct 1″ when you read the radius.



ANGLE	POSITION
30°	14⅞″
45°	16¼″
60°	17⅝″
65°	18″
70°	18½″
75°	19″
90°	20¼″

PROTRACTOR: You can lay out common angles with a triangle formed by the first three blades of the rule. Keep a chart of the angles made by various rule-tip positions, as shown.



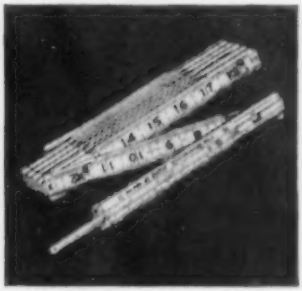
TEMPLATE: Shaping and pinning the blades of the rule with a nail, you can duplicate an angle for transfer to material that must be cut to cover or fill a triangular area. END

WHITE CLAD MEZURALL
Ideal for the hand craftsman. Snow white line double graduated with feet and inches, and consecutive inches. ½" wide line in 6, 8, 10 and 12 ft. lengths. 6 ft. only 98c.

WHITE CLAD SUPER MEZURALL
Wide ¼" line extends further unsupported. Same accurate easy to read double graduations as regular Mezurall. Strong die-cast case. 10 and 12 ft. lengths. 10 ft. only $2.39.

EXECUTIVE THINLINE
The ideal pocket tape. Thin and light, and accurate . . . like a fine watch. Bold black figures on snow white line. 6 and 8 ft. lengths. 6 ft. only $1.50, beautifully gift boxed.

WHITE CLAD BANNER
A necessity for gardening, decorating and construction. Tempered steel blade graduated to 8ths. Rust resistant steel case covered with handsome maroon vinyl. 25, 50, 75 and 100 ft. lengths. 50 ft. only $5.00.



X-46 EXTENSION WOOD RULE
Extra strong for heavy duty use. 6" fitted brass slide for accurate inside measurements. Bold markings embedded in wood and plastic coated wear longer. 6 ft. length only $2.50.

PRECISION TOOLS
Lufkin precision tools are favorites of the most exacting craftsmen. Illustrated is the full finish Chrome Clad mike with exclusive cam lock, friction thimble, and carbide tipped anvil and spindle.

IT COSTS LESS TO USE GOOD MEASURING TOOLS

choose the ones best for you from the only complete line

The success of any project, from bird house to bridge, depends on accurate measurements. You can make accurate measurements easily . . . and save time, timber and temper . . . only with good measuring tools that are suited to your needs.

You can buy with confidence when you select a measuring tool bearing the Lufkin name. It has represented accuracy, durability and convenience since 1869 . . . it represents your most economical buy.

The next time you're passing a tool display, give a thought to your measuring tools — then pick up the Lufkin tape, rule and precision tools you need. They're at hardware, lumber and tool dealers everywhere.

BETTER MEASURE WITH

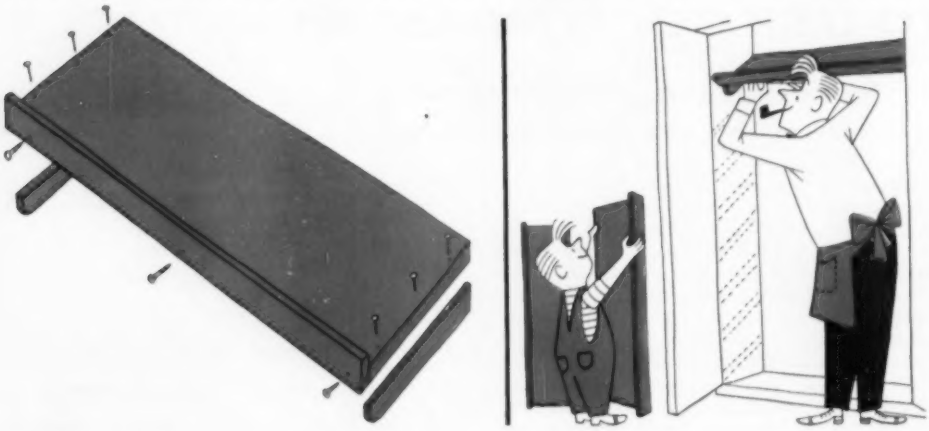
LUFKIN 483

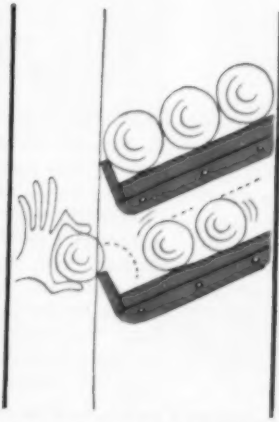
TAPES • RULES • PRECISION TOOLS

THE LUFKIN RULE COMPANY, Saginaw, Michigan

Wordless Workshop

By Roy Doty
and Jo Stover



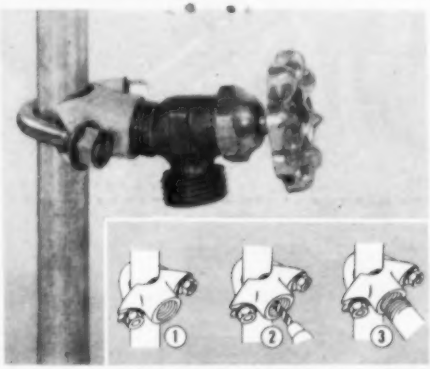


Next Month: Tracks to help guide a car in and out of a garage

New for the Handyman

1. Floor Tiles Resist Weather. Said to be the first floor tiles to withstand the effects of the outdoors, these synthetic-rubber patio tiles have many uses. You can use them as settings for barbecues and grills, garden paths, even garage approaches. Because a special adhesive is necessary and the base must be specially prepared, the maker recommends that you have the job done by a professional tile setter. Indoors, you can install the units yourself as you would any floor tile.

2. Counter Topping Is Flexible. Because it's so flexible, you can easily install this vinyl-plastic material on counter tops and in drawers. The manufacturer says anyone familiar with tools can install a de luxe kitchen counter top in a day or less. The material can be run across the counter and up the wall or counter backboard in one piece, producing a curved corner that's easy to clean. It is said to cut dish clatter and reduce breakage.



3. Faucets Where You Need 'Em. With only a drill you can connect this clamp-on pipe tee to an existing water pipe. No pipe-fitting experience is needed to install a shower, a utility faucet or an automatic washer. You do the job in three steps: (1) shut off the water and clamp the saddle tee to the pipe in the desired location; (2) drill a hole in the pipe, using the tee as a drill guide; (3) screw the new outlet or faucet into the tee.

For more handyman news, turn to page 226

NEW! MILLERS FALLS Router-Plane-Shaper

WITH REVOLUTIONARY NEW LINE OF LOW-COST ROUTER BITS

Built for professional performance

3 TOOLS IN 1

Imagine! – an exciting new 3-tools-in-1 combination loaded with exclusive features to give professional results – yet priced to bring the adventure of fine cabinet-work within reach of everyone! It's a Router, a Plane, a Shaper! – that will do hundreds of jobs quicker and better – including dado cuts, moldings, fluting, rabbet cuts, dovetail joints, inlaying, planing and shaping. A real precision tool with plenty of power and speed, that anyone can use!

Plus . . . a revolutionary new line of 17 popular Router Bits, made of Special M-2 High Speed Steel – faster, longer-lasting – at 1/3 less cost than other types.

See and buy the Millers Falls Router-Plane-Shaper and its complete line of attachments at your favorite dealer's . . . or write us for name of qualified dealer nearest you.

CHECK THESE IMPORTANT FEATURES

POWER UNIT ✓ Rugged 3 amp. motor ✓ Ball bearings throughout ✓ 30,000 R.P.M. for smoother, faster, cleaner cutting

ROUTER ✓ Large 8" dia. base and big hardwood handles for positive control ✓ Direct-reading scale for fine depth adjustment ✓ Exclusive micrometer-screw adjustment for control of cut location ✓ Extra long rods for long reach cuts ✓ Base and non-marking sub-base take all popular templet guides

PLANE ✓ Big 14" shoe ✓ Outboard arbor support ✓ Micrometer-screw adjustment for front-to-rear shoe and cutter alignment ✓ Direct-reading depth adjusting scale ✓ Notched quadrant for quick bevel cuts (−15° to +45°)

SHAPER ✓ 1/3 cost of comparable models ✓ Big work surface (24" x 7½") ✓ Built-in motor mount for quick, easy changeovers ✓ Accurate depth adjustment ✓ Adjustable fence ✓ Rugged 1" marine plywood table

Plus . . . a special "package" of exclusive firsts for plastic laminate application!

FREE AT YOUR HARDWARE DEALER'S
Folders and full information about the Router-Plane-Shaper and other fine Millers Falls Tools . . . or write

MILLERS FALLS TOOLS SINCE 1868

MILLERS FALLS COMPANY
Dept. PS-19, Greenfield, Mass.

FINEST HAND AND POWER TOOLS MADE FOR HOME AND INDUSTRY

4. Do-It-Yourself Bathtub. Molded of glass fiber, this new tub is so light (18 pounds) that you can install it single-handed. Complete installation instructions and a matching front panel (not shown in photo) are furnished with each tub, making it easy for you to put in that extra bath or replace an old-fashioned tub. The tub looks like porcelain, yet it is said not to chip or craze under blows that would damage a conventional tub. You have a choice of molded-in colors.

5. Insulation Forms in Wall. Some day soon, when you want to insulate the walls of an existing house, you may cut a hole through the siding and pour in a phenolic resin and acid catalyst. The liquid resin will then foam to 200 times its original volume, filling the space between the studs with foam insulation. The photos at the left show how the technique was demonstrated in a laboratory setup. The near picture reveals the foam blanket after the retaining structure had been pulled away. It is expected that builders may use the process because foamed-in-place insulation will save storage space and decrease shipping loads.

More information *about handyman products can be obtained from: 1. Robbins Floor Products, Inc., Tuscumbia, Ala.; 2. Armstrong Cork Co., Lancaster, Pa.; 3. Sall Bros. Co., Rockford, Ill.; 4. Sterling Precision Corp., 1302 Expressway Drive, Toledo 8; Bakelite Co., Division of Union Carbide Corp., 260 Madison Ave., New York City 16.*

How many of these projects are you planning for your home?

- ☐ Installing ceiling tile
- ☐ Reupholstering
- ☐ Building furniture
- ☐ Installing insulation
- ☐ Making picture frames
- ☐ Making or repairing screens
- ☐ Installing low-voltage wiring
- ☐ Installing built-in speakers
- ☐ Tacking chicken wire to shelters, cages, storage bins

●

- ☐ Erecting tree and shrub shelters
- ☐ Laying roofing paper
- ☐ Re-canvasing lawn furniture
- ☐ Installing insulation
- ☐ Installing wooden under-course shingles
- ☐ Applying cornerite
- ☐ Applying felt and waterproof paper to exterior walls
- ☐ Installing flashing paper
- ☐ Laying underfelt for roofing
- ☐ Installing vapor barriers

●

- ☐ Building trellises or arbors
- ☐ Applying asphalt shingles
- ☐ Applying metal lath to studding
- ☐ Laying underflooring
- ☐ Applying metal discs for built-up tar and gravel roofs
- ☐ Applying corrugated paper for installing blown-type rock wool

The Bostitch T5 Tacker helps you do all these better and faster!

Just aim and squeeze. A rugged staple gets a powerful grip exactly where you want it. Can't mar surfaces. Approved by leading makers of ceiling tile, used by professional craftsmen. Wonderful in tight places!

The Bostitch H2B Stapling Hammer helps you do all these better and faster!

Use this high-speed, self-feeding stapling hammer on all these jobs—and wherever you want light tacking or nailing. Holds 160 staples. One-hand operation—other hand's free to position work. Lightweight with a long reach. Takes the fatigue out of drawn-out jobs.

The Bostitch H4 Stapling Hammer helps you do all these better and faster!

Big jobs go fast when you work with the H4. Every easy blow drives a staple ¾" deep. Staple legs spread inside work for more holding power than a nail. For roofing you need less staging, finish 4 times faster than with hammer and nails!

See these time-and-money-saving Bostitch Staplers at your Building Supply Dealer's—or mail the coupon.

Fasten it better and faster with

BOSTITCH®

BOSTITCH, 569 Briggs Drive, East Greenwich, Rhode Island

Please send me information on the following:

☐ T5 Tacker ☐ H4 Stapling Hammer
☐ H2B Stapling Hammer ☐ Ceiling Tile Installation Handbook

Name _____

Address _____

City _____ Zone ____ State _____

How to Keep House Drains Open

When water won't flow, or just gurgles from a sink, these do-it-yourself tips may save you a plumbing bill

By Ralph Treves

IT'S reasonable to expect that when you pull the stopper the water will run down the drain. But sometimes this doesn't happen, or the water dribbles away in an exasperating trickle.

What's wrong? Most likely the trouble is right at the sink—or in the trap just below it, where paper, hair, lint or grease may be blocking the soil line.

The trap, incidentally, is not there for the purpose of trapping this foreign material. A trap has a completely different and important function: Its gooseneck "U" shape holds water to prevent noxious sewer gas from coming into your home.

When water merely seeps out of your kitchen or bathroom sink, first check the stopper or strainer at the top and clean out any lint or hair that may be present. If all seems clear at the top, open the trap cleanout underneath by removing the plug with a monkey wrench (there's water in the trap, so place a pan or pail underneath before you loosen the plug). Pull out any lint, hair, sand, grit or other matter with a short stiff wire.

But if these actions fail, what then? Any one of several conditions are possible and each must be checked until the trouble is located and corrected.

Grease is the bugaboo in the case of kitchen drains, which frequently become clogged by an accumulation in the lines near a 90-degree bend. The sharp turn in the pipes slows the flow of water; grease hitting the colder pipe tends to congeal at that point. (That is one reason why soil pipes should be connected with "Y" fittings at a specified slope so the waste water flows out evenly, and there is no turn to block waste matter.)

Sometimes this fitting, which could be the location of your trouble, is too far from the nearest trap that would permit entry of a cleanout auger or snake. In that case, it will be necessary to drill a hole in the pipe and tap the hole for a threaded plug so it can be closed after the line is cleaned out.

Push a springy coiled-wire pipe auger into the cleanout hole to break up soil accumulation. The auger wire at the free end is bent into a hook shape so it will cut into hard grease, which will then be washed down with the flow of water.

There are other ways to cope with kitchen-sink grease. One of the best is to pour boiling water down the drain, either as a routine every day or just after washing the dishes.

For toilet stoppage, the rubber force cup almost always does the job. Make certain there is some water in the bowl, work the plunger up and down for both suction and pressure action. If this fails, a screw-type coil auger may be used.

These are examples of common, everyday drainage problems that crop up in every home. But sometimes there is a more acute condition, as when the entire sewage line is blocked.

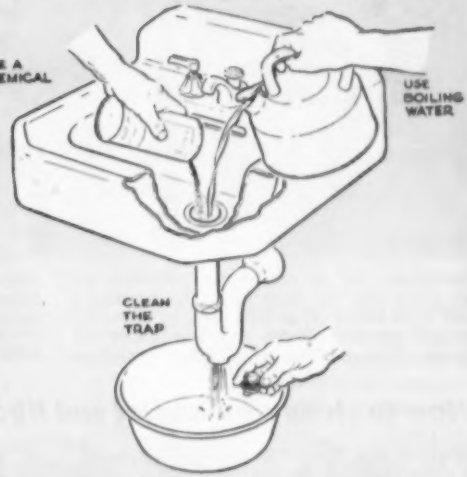
Usually this is solved by opening the

Before calling the plumber, refer to this guide sheet and you may be able to open a clogged drain yourself. This fact sheet is one of a monthly series devoted to home repairs now appearing in POPULAR SCIENCE. Each sheet is designed for keeping in a loose-leaf binder.

Next Month: House gutters.

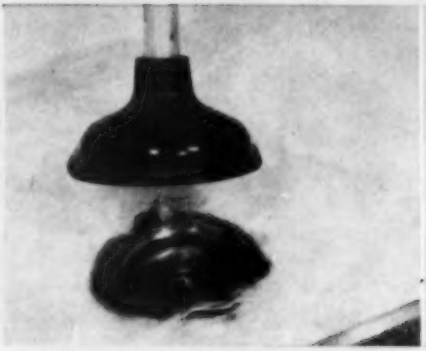
Popular Science Fix-It File

How to avoid drain stoppage



PREVENT TROUBLE by (1) pouring boiling water into the kitchen sink after washing dishes to keep grease from congealing in the pipes; (2) using caustic chemical regularly to clear out congealed fats (it's usually best to restrict chemicals to city sewage systems); (3) cleaning out lint, hair, sand and other matter from accessible traps. When stoppages occur, try one or all of these measures before resorting to the tools and more difficult methods shown below and on the reverse page.

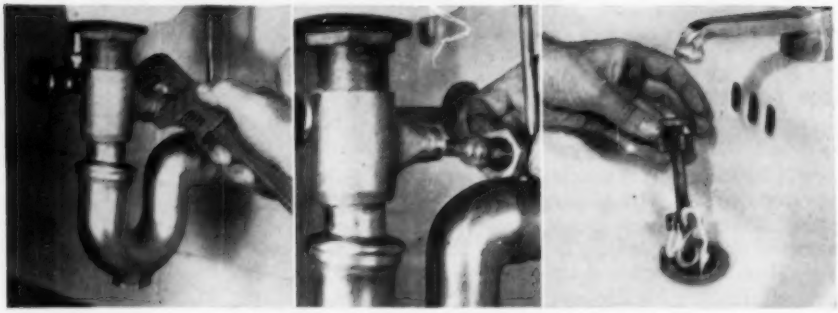
For stoppages, try one of these clean-out tools



A FORCE CUP AND FLEXIBLE SNAKE are tools that will find frequent use in any home. Hold cup (also known as a "plumber's friend") over waste outlet and pump it up and down until stoppage is cleared. For a sink or lavatory drain, partly fill the basin with water first. A flexible snake can be thrust into sink or lavatory trap openings.

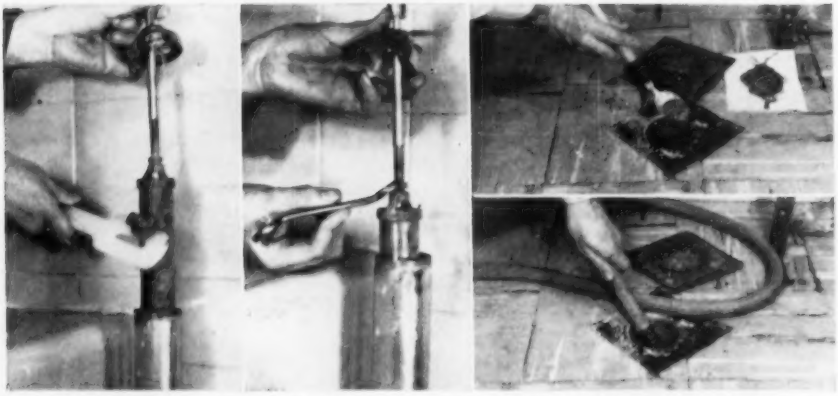
OTHER TOOLS you might use are a simple coil-spring type of snake and the more professional auger. On a toilet, apply the auger with caution to avoid chipping the porcelain inside the trap, feeding the auger coil slowly. When a drain trap has been opened, be sure to replace the gasket (see center photo) when you are putting back the plug.

How to clean a lavatory stopper



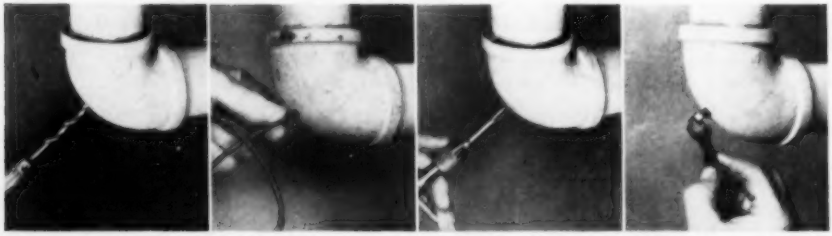
REMOVAL OF A LAVATORY STOPPER for cleaning may be done either by turning it out from above or, as seen here, by loosening a nut on the lift-rod coupling under the basin. Then pull the rod back (center) so that retainer ball is clear of fitting. This permits you to release the catch on the stopper and lift the latter out of the bowl. After clearing off entangled lint and other debris, replace parts in the original order.

How to clean a tub outlet and floor drain



FOR FAST DRAINAGE you should do both jobs occasionally. On tub outlet like one shown, loosen cap at top of tube, pull out stopper and scrape off slime and other matter. An adjustment nut (center) holds stopper at right height for quick drainage. An old spoon taped to a dowel handle can be used to scoop sand from a floor drain. Then flush drain with garden hose. Trap must always have some water to seal out noxious sewer gas.

How to clean out a soil line



IF SNAKE DOESN'T REACH trouble spot, drill a hole in an elbow and use an auger in both directions to push out blocking waste. Thread hole for a hex-head brass plug and coat threads with petroleum jelly. Hole can then be opened again when necessary.

cleanout trap which you'll find near the point where the soil line goes out from the house. The trap may be clogged with sand or other matter. Plug caps on the cleanout usually are thin brass shells. If the plug is frozen in, it must be torn apart for removal. Use a sharp chisel to make a hole in the lead cap, then pry upward to remove the entire top. The thin threaded part against the trap sides then can be folded towards the center by hammering until free of the threads, and removed.

When replacing a cleanout plug, use one that is either brass, or that has a cast-iron center with tapered lead threads molded on the outside. If the brass cap is used, coat the threads with petroleum jelly before turning it in.

One caution in this situation: The new cap must be replaced tightly, with threads correctly aligned so it is airtight to keep out sewer gas. Be careful also not to crack the cast-iron trap or cleanout.

The outside storm drain is another frequent cause of difficulty. This usually is in a concrete floor (at the foot of cellar stairs, in front of or inside the garage, in walks at the side of the house). The floor drains tend to accumulate sand which does not wash down. Easiest way to cope with this is to clean the drains periodically, using a spoon attached to a long handle such as a length of ½″ dowel.

If the drains seem free but the flow is still sluggish, the trouble most likely is that the soil line leading to the sewer or cesspool is clogged with tree roots. This may be due to a weakness in the kind of soil pipe—certain species of trees spread roots to any available water and are able to penetrate many soil-pipe joints.

Rotary soil-pipe cleaners, used by professionals, help solve this problem temporarily, but if the trouble persists, replacement of the pipes may be necessary.

Quite rare is the condition where soil pipes were not properly installed, and create chronic blockups—because of incorrect pitch in the soil line. Nothing but replacement will do.

Pour water into cellar floor drains at least once a month to keep the U trap sealed against sewer gas. Other traps, because of constant use, always have water at correct level. But little-used floor drains tend to dry up. END

7 Money-Saving Plumbing Tips

1. Open and close all shutoff valves once or twice each year. Then, when needed, they won't be "frozen."

2. Drain the water heater twice a year or more to remove any sludge or rust accumulation. This settles to the bottom of the tank just above the burner and cuts down efficiency.

3. Don't put garbage down drains. You can start an argument among plumbers by asking if you should put coffee grounds down the kitchen sink. Some say it helps cut the grease; others maintain that it plugs the drain line. The safe thing is not to put anything down the drain line you don't need to.

4. Before calling a plumber, examine the item to be repaired. If a brand name or type of fixture is marked on it, write it down. Give a description of piping if you are reporting a leak—whether copper or galvanized-iron pipe—its size and location. Specific information will help the plumber bring everything needed for the repair—on the first trip.

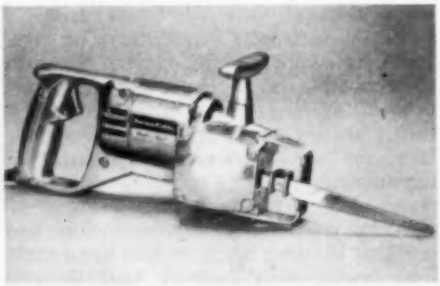
5. Before cold weather strikes, close the stop and drain valves in the house (houses in cold-weather areas have them) on each line going to an outside faucet, with the exception of special frostproof lawn faucets. Open the outside faucets and also the small drain cock on the stop and drain. This will remove all water in the section of piping likely to freeze.

6. Do not pour hot water in the toilet bowl—it may crack.

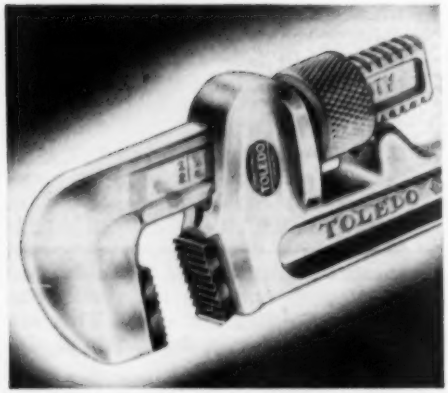
7. Inspect the flame of the water-heater burner. If it is red or orange (not predominantly blue), it needs adjusting. It's not giving as much heat as it could, and it forms carbon on the bottom of the tank, which slows down heating of the water. Some of the carbon drops into, and clogs, burner outlets.—*Loyd Weaver, Phoenix, Ariz.*

New Tools

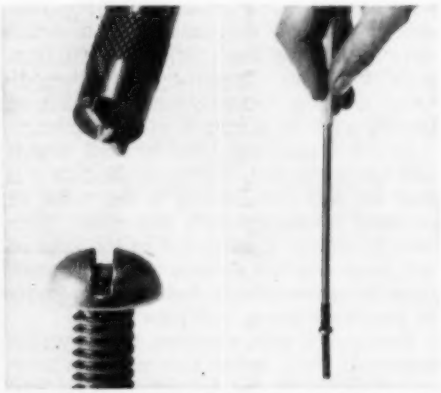
1. Tool Shears Bolts Clean. Need a shorter bolt or machine screw? You can make short ones from long ones by shearing them with this tool. Threaded shearing holes in five sizes—4-40, 6-32, 8-32, 10-32 and 10-24—cut the bolts without damaging the threads, and they are automatically deburred upon removal. Other features, not new to the tool, are slotted jaws for crimping solderless terminals, a section for cutting wire, and six slots for stripping insulated wire.



2. Power Saw Has Orbital Motion. The teeth of this fast-cutting saw touch the work only on the cutting stroke. On the return stroke the blade lifts away. With a choice of eight blades available, you can cut a wide range of materials including hardwood, ferrous and nonferrous metals, asphalt, plaster, asbestos, hard rubber and plastics. The blade is located close to one side of the saw, permitting close cuts in corners. It starts inside cuts without the need for drilling holes.



3. Lightweight Pipe Wrench. This forged-aluminum pipe wrench weighs less than half as much as a comparable steel or iron tool. Only the adjusting nut and replaceable insert jaws are steel. For work in hazardous locations, the maker supplies non-sparking beryllium-copper insert jaws. The aluminum wrenches come in five sizes—10", 14", 18", 24" and 36".



4. Screwdriver Grips Screws. You can remove screws from hard-to-reach places as well as install them with this locking screwdriver. The spring-loaded center section of the blade is cocked by twisting the knurled end. When the blade is inserted in the screw, a twist of the handle triggers the spring and locks the blade in the slot. A reverse twist releases it.

More information *about the products shown on this page can be obtained from: 1. Vaco Products Co., 317 E. Ontario St., Chicago 11; 2. Porter-Cable Machine Co., 753 James St., Syracuse, N. Y.; 3. Toledo Pipe Threading Machine Co., 1445 Summit St., Toledo 4; 4. Rinck McIlwaine Inc., 16 Hudson St., NYC 13.*

A PRODUCT FOR EVERY SHOP NEED...

PERMACEL—LEPAGE'S PRODUCTS

Gus Referees a

In the livestock show at the county fair, no holds were barred—but Gus hoped to keep the mayhem down

By Martin Bunn

THE opening day of the annual county fair was always a hectic one for Gus Wilson and Stan Hicks in the Model Garage. The town's merchants were busy arranging booths to display their products. Farmers and ranchers brought in their prize livestock and produce, their wives and daughters entering their choicest cookery. Competition was keen for the various blue ribbons and other awards of merit. On this day the county really hummed.

The day started off badly for the Model Garage. The telephone was ringing when Gus opened for business at eight o'clock. A customer had wrecked his car 20 miles up the highway and needed a tow truck. Not wanting to leave the garage for any length of time, Gus sent his helper, Stan Hicks, to bring in the wreck. Stan had just pulled out when Barney Overholtz, the newspaper route boy, drove up to the pumps.

"George Fraser wants you to come out on the Big Hill road right away," Barney told Gus. "He thinks that Mike Treadway has jimmied his truck in some way, so that he can't enter his prize bull in the livestock show. He seemed awfully excited about it."

Gus chuckled. "Treadway and Fraser are always excited on opening day of the county fair. Since Stan's away with the tow truck, I can't leave the garage—that is, unless you'd be willing to handle the pumps while I'm gone."

"Sure thing," Barney said. "My newspapers are all delivered."

WITH Barney taking care of the Model Garage, Gus tossed his tool kit into his light service car and headed out on the Big Hill road. He came upon Fraser's stalled one-ton truck on a steep grade on the far side of Big Hill. It was considerably overloaded with the largest, shiniest-coated Holstein bull that Gus had ever seen, together with a Poland China boar and sow, some enormous pumpkins and squashes, and other products of the field. George, his comely wife and their pretty, teen-age daughter, Sally, were peering anxiously beneath the truck, to the accompaniment of assorted bull bellows and pig protests.

"Morning, folks," Gus greeted them, as he pulled

"It had better run now," Fraser said, "or I'll go over to Treadway's place and wring his neck."

Bull Fight

up and got out his heavy tool kit. "What seems to be the trouble?"

"The motor runs," Fraser said worriedly, glancing at his watch, "but the rig won't turn a wheel. It's eight-thirty now and the deadline for entering stock in the livestock show at the county fair is 10 o'clock sharp. This bull of mine is going to take the blue ribbon this year, for sure, if I can get him there in time."

"And," Mrs. Fraser declared, "my upside-down cake has a mighty good chance of winning first place in the cake-baking contest."

Sally Fraser turned her big eyes on Gus. "Just wait until Freddy Treadway sees me walk off with the blue ribbon for homemade bread. He'll sit up and take notice then."

"With those eyes, Sally," Gus said, "you don't need to know how to cook. Start her up, Fraser. We'll see how she acts."

Fraser started the motor and put the truck in gear, but the vehicle didn't move.

"Probably a broken axle," Gus said, "but it could be anywhere in the drive line. Shut off the motor and I'll see."

WITH the motor stopped, but the truck left in gear, Gus jacked up one rear wheel. He turned it by hand, let it down and jacked up the other. Finding that he could rotate both wheels without turning over the motor, and doubting that the vehicle would have *two* broken axles, he dismissed broken axles from his mind to turn his attention elsewhere.

"It just might be a stripped differential," he said. "Start her up and try it in gear again, Fraser, while I check underneath."

Fraser was running the motor in gear, with Gus underneath with his hand on the torque tube containing the drive shaft, when Mike Treadway pulled alongside in a three-quarter-ton pickup truck. It contained, as far as Gus could make out, a bull that was a mate to Fraser's. Treadway, a long, lean, cadaverous man, thrust his craggy features out the pickup window and spat in the road.

"Having trouble, George?" he inquired.

"Trouble!" Fraser exclaimed. He shut off the motor to get down and move over to Treadway with his thumbs hooked belligerently in the bib of his overalls. "It seems to me, Treadway, that I hired your sprout, Freddy, to grease this truck only yesterday. The rig was in good shape then. You don't suppose, Treadway, that the fact that my bull is due to beat yours at the fair has anything to do with my truck's rear end being ripped out now?"

"Your bull beat mine!" Treadway cried, peering at Fraser's animal curiously, as though he'd never seen it before. "Now, you wouldn't be planning to enter an animal like that in the fair, would you, George?"

"You know I am," Fraser retorted. "In fact, you've been leaning over my fence, ogling the critter all summer, Treadway, trying to figure out some way to beat him. If Gus finds a handful of your old bolts and nuts in my differential, I'll come looking for you."

LOOKING up at young Freddy Treadway, who sat beside his father, Sally Fraser protested, "Pa, Freddy wouldn't do that. He wouldn't do anything to hurt me."

"Hurt *you*!" Fraser grumbled. "It's my bull that's hurt, not you. With my truck shot, how am I going to get the bull to the fair in time?"

"And then," Mrs. Fraser said, "there's my upside-down cake."

"Upside-down cake!" Mrs. Treadway exclaimed. "My goodness, Sarah, are you going to enter an upside-down cake, too?"

"Since Mrs. Treadway could hardly have put bolts in my differential," Fraser said drily, "let's forget the cakes, shall we?"

"I didn't put anything in your differential but grease," Freddy Treadway protested.

"Maybe your grease isn't any better than your bull, George," Treadway said, grinning. "Well, we'll be getting on. I wouldn't want to be too late to enter the best bull in the county."

Treadway drove off, leaving Fraser standing in a cloud of dust, muttering threats.

GUS thrust his head out from beneath the truck. "The rear end isn't torn out, Fraser. I had my hand on the drive-shaft torque tube when you ran the rig in gear. If the drive shaft had been turning inside the torque tube I'd have felt the vibration. It wasn't turning, so I know that your trouble is ahead of the drive

Dramatic! Fir plywood 1/4" wall paneling over studs. Butted joints, 3/4" square fir strips on 4" centers. For natural beauty, Deft-finish walls, ceiling, beams, sofa base, and as protective coating for interior stone.

deft®
WOOD FINISH
BAR TOP

deft-ly yours

Interior WOOD FINISHING made easy.

Deft *simplifies wood finishing,* makes possible a semi-gloss, fine-furniture finish in a few hours instead of days as required by conventional finishes.

SEALS, PRIMES, FINISHES... dries in 30 minutes.

Nothing else to use, no thinning, no fussing around. Simply flow it on, Deft does the rest. It *levels* down of its own accord to a mirror-smooth surface. Apply by roller, brush or spray.

SAVES TIME. Deft is a *natural* wood finish for the do-it-yourselfer. A 3-coat BAR TOP finish can be completed in half a day... ready to use... and be admired. *Deft will not darken with age.*

TROUBLE-FREE... Any "misses" can be spotted in and steel-wooled to match. Any accidental "sags" can be steel-wooled out and not show. There's no such thing as "lousing up" a Deft finish. Does not raise the grain. The final coat may be steel-wooled to a rubbed-effect fine-furniture finish.

Deft-finish PANELING, CABINETS, FURNITURE, FLOORS ... ALL INTERIOR WOOD

the number one wood finish from coast to coast

Be GOOD to your WOOD... deft-finish it

Industrial Arts Classes

Deft is used in school, college, adult training classes all over America.

deft ALL-PURPOSE tips

Deft Belongs In Every Home Work Shop

Roll It On application will save time on paneling, floors, desk and table top areas.

●

Protects New Wood. Apply one coat of Deft to all surfaces of new wood, immediately. Protects against grain raising, darkening, warping, dust, grime, fingerprints and pencil marks.

●

Steel Wool the final coat for smooth fine-furniture finish, buff-finish with dry cloth for high gloss.

●

Deft-finish Floors and use them the same day.

●

Deft-finish In Lathe. Apply Deft to turned wood in lathe. When dry, spin against steel wool for lustrous finish. Excellent for detail work such as picture frames and carving.

●

Coat Interior Brass. Protects metal against tarnish.

●

Clean, Non-sticky protective coating for tools, metal parts as well as wood handles.

●

Smooth Operation. Use on window slides and drawer runners. The more you use them the smoother they operate.

●

Seals patching plaster for immediate painting.

●

Protects interior flagstone and natural stone. Cleans easily.

●

Stains, Fillers, Glaze. Apply Deft, as over raw wood. Many special effects may be achieved with Deft.

●

If you're not using Deft, you're not getting a Deft-finish.
Wherever paints are sold, or write:

Desmond Brothers
1826 W. 54th St.,
Los Angeles 62, Calif.
Please send me more information on Deft.

Name_____
Address_____
City_____ Zone____ State____
P.S. 9-57

shaft, either in the universal joint, transmission or clutch. Run it in gear again and I'm pretty sure I can locate it."

With the motor turning over in gear, Gus had one hand on the drive-shaft torque tube, feeling for inner vibration, his ear cocked for any sound that might indicate a stripped universal joint, stripped gears in the transmission, or a broken clutch spline shaft. Suddenly a familiar odor smote his nostrils.

"Shut it off, Fraser!" he yelled above the sound of the motor.

Gus came out from beneath the truck, took up the floorboards and removed the clutch inspection plate. Peering into the interior with his flashlight, he saw that the uppermost stud bolt, which held the clutch pressure plate to the flywheel, was backed off and loose. He touched the starter button off and on, to turn the motor one complete revolution. It showed him that all the stud bolts, which held the vital clutch pressure plate to the flywheel, were very loose. Using an extension spin wrench, he carefully tightened each bolt, replaced the floorboards, checked the clutch pedal throw for floorboard clearance.

"Try it now, Fraser," Gus said. "That loose pressure plate had your clutch slipping so much that I could smell hot clutch lining. Maybe it won't pull this hill now with this load. The clutch facings may be too glazed and worn from slippage to do the job."

"It had better," Fraser said grimly, "or I'll go over to Treadway's place and wring his neck. You can bet your bottom dollar that he had Freddy back those bolts off."

Gus shook his head. "I'll admit that the loosening of the stud bolts holding a clutch pressure plate is something that doesn't happen very often, but I'm sure that Freddy didn't loosen these. The dirt on the bolt heads showed that they hadn't had a wrench on them in a long time. Probably the fault lies with the mechanic who installed the clutch. When tightening these bolts against clutch spring pressure a man can be fooled into thinking that they're tight when they're not. Try it and see if it will pull the hill. If you drive as fast as the law allows you'll have time to enter your bull at the fair. It's just a little after nine."

When the truck lunged into the pull, Fraser didn't even look back. He went barreling up Big Hill, while the magnificent bull in the back bellowed tremendously at a comely cow it had spotted in a nearby pasture, no doubt wishing that Gus Wilson had kept his grease-smeared nose out of George Fraser's faulty truck transmission.

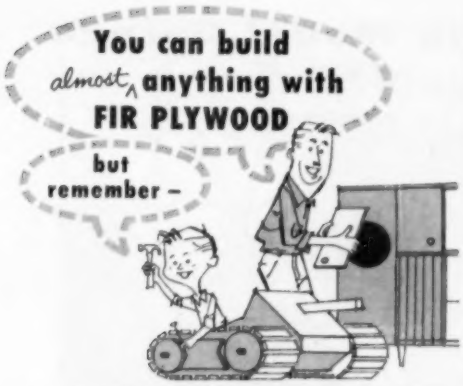
"Notice how this old baby just glides over the bumps?"

STROLLING through the county fair with Stan Hicks a couple of evenings later, Gus smiled to himself when he saw the Treadways and the Frasers standing together in the livestock show admiring the blue ribbon that decorated Fraser's bull. They were talking amiably. Freddy Treadway was laughing and Sally was using her big eyes on him.

"If you hadn't proved Treadway's innocence," Stan Hicks said, "those folks would have been enemies from here on out."

"I doubt it," Gus replied, grinning. "For them, the county fair comes but once a year. Within a month they'd have been leaning over the fence, laughing about it, each one figuring how he could beat the other at the next livestock show." END

NEXT MONTH: Gus makes a miser wiser.



1 – LOOK FOR THE DFPA QUALITY TRADEMARK

When you see the letters DFPA on panel you *know* you're getting plywood quality-tested to meet rigid industry standards. DFPA trademarks attest quality, performance and value.

2 – CHOOSE THE RIGHT GRADE FOR EACH JOB

Choose Exterior-type (waterproof glue) for outdoor and marine uses; Interior-type for inside jobs. Within each type are several *appearance* grades (panels with one good side, two good sides, etc.). See your lumber dealer. He'll help you choose the right grade, help with ideas and plans.

SPECIALTY PANELS include 1. *textured plywood* with smart grooved, striated or brushed surfaces for special decorative effects; 2. *overlaid plywood* (smooth, durable resin-fiber surfaces) for extra quality work.

FREE: Helpful booklets that show how to buy, use and finish plywood. Also, list of available homecraft plans. Write (USA only) Douglas Fir Plywood Assoc., Tacoma 2, Wash., Dept. 11.

See your lumber dealer or use coupon below.

Large, easy-to-follow plans contain illustrated step-by-step instructions and complete bill of materials.

No. 30. 7′ 9″ Pram Dinghy

No. 35. 11′ 3″ Outboard

No. 40. 13′ 4″ Outboard

No. 45. 13′ 9″ Punt

No. 50. 15′ Outboard

No. 55. 15′ 11″ Runabout

No. 60. 18′ Day Cruiser

No. 65. 20′ Cabin Cruiser

***Use Only Exterior Fir Plywood For All Marine Construction**

(EXT-DFPA® Means 100% Waterproof Glue!)

Douglas Fir Plywood Association, Dept. 11, Tacoma, 2, Wash.

Please send plans checked below. I enclose 25c for each. (Good in U.S.A. only)

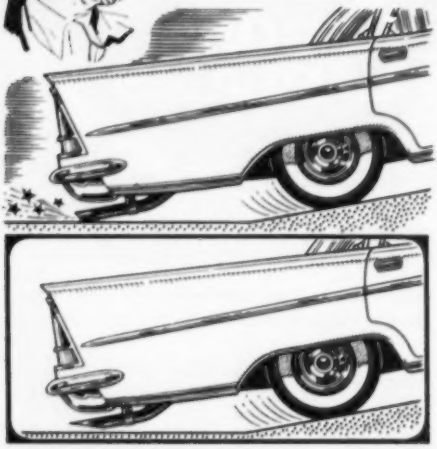
☐ No. 30 ☐ No. 35 ☐ No. 40 ☐ No. 45 ☐ No. 50 ☐ No. 55 ☐ No. 60 ☐ No. 65

Name_____

Address_____

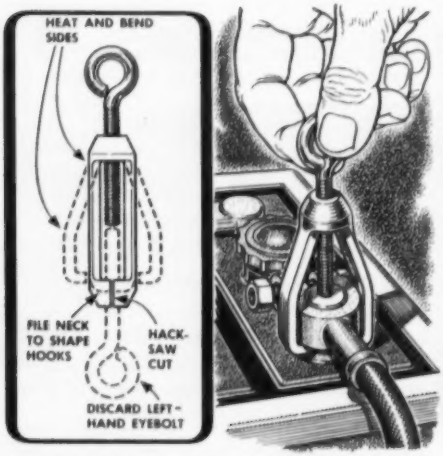
City_____ Zone____ State_____

Hints from the Model Garage

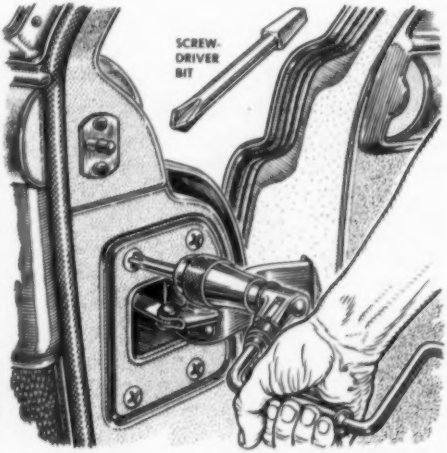


A tailpipe that scrapes as you enter or leave a steep driveway can be cut without shortening it. Hacksaw a piece from the bottom of the pipe at a long angle. You gain road clearance, yet the overhang keeps the bumper free of exhaust stains.

Corrosion can be cleaned from inside distributor-cap terminals with a wire brush made from a discarded hand-brake cable. Cut the cable near its end and use its adjusting rod as a handle. Unravel a few strands, insert in the terminals, and twist.

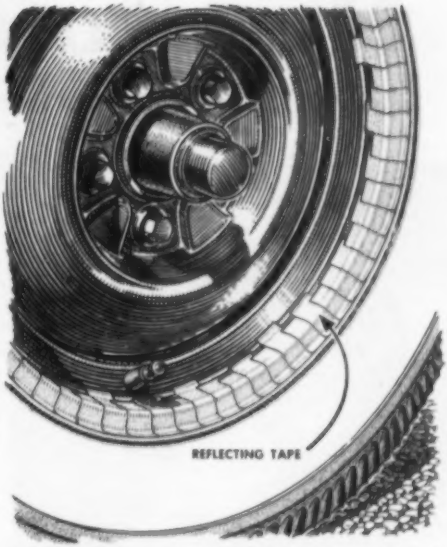


A safe battery-terminal puller can be made from a turnbuckle. Discard the left-hand eyebolt and hacksaw the threaded end down the middle. Spread the sides and file off enough from the split end to make hooks that fit under the cable clamps.

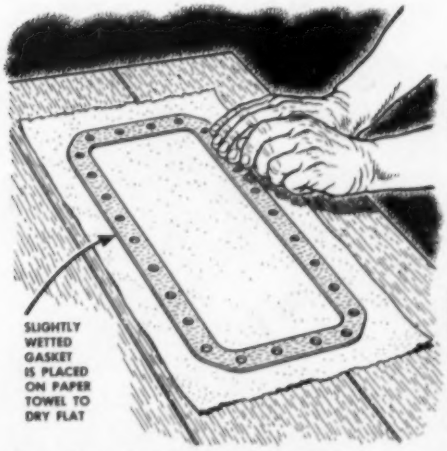


For that extra leverage needed to loosen the adjusting screws on door hinges without damaging their heads, try a carpenter's brace. Screwdriver bits with shanks to fit the brace can be purchased for both Phillips-head and slotted screws.

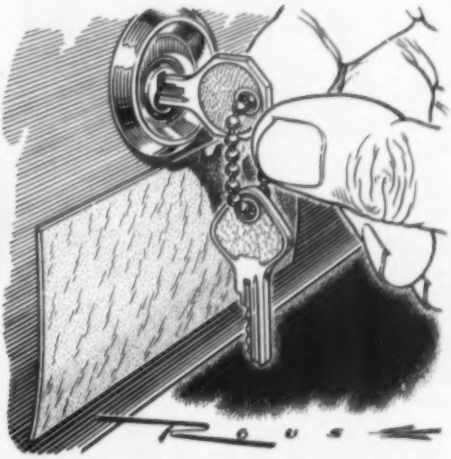
To pinpoint engine noises, use a stethoscope made from a radio earphone. Solder a stiff wire to the diaphragm, and the earphone's magnet to the wire's other end. Touch the magnet to different parts of the engine to listen and trace noises.



Short strips of reflecting tape placed side by side around wheel rims serve two purposes: They reflect an oncoming car's headlights when you drive out of a side street and they eliminate any occasional tendency for the wheel covers to creak.



A cork gasket that has shrunk can sometimes be restored to its original size by dipping in water and laying it flat long enough to absorb the moisture and swell. Don't soak it for a long period of time, as it might come apart or crumble.



The noise of keys jangling against the dash can be silenced by cementing a small square of leather to the metal below the ignition switch. Rubber cement will hold it without damaging the finish. Colored leather can be bought at craft shops.

How to Take Care

Advance report to Saturday mechanics reveals inside details

By William Carroll

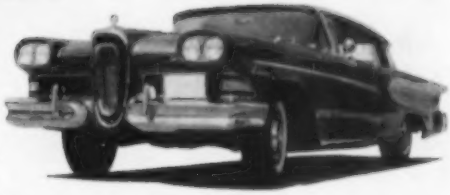
FROM the startling front "impact" ring to raised-eyebrow tail light, Edsel boasts unexpected ease of servicing and minimum maintenance requirements. Engines are the "E400" of 361 cubic inches (303 hp.) and "E475" of 410 cubic inches (345 hp.) with machined combustion chambers to reduce any tendency to run rough as they carbon with use. Hydraulic lifters are fitted to both engines, and valves need no adjustment.

Three-stage cooling for the E475 engine has two block thermostats holding water in the heads and intake manifold until it reaches 140 degrees. Water then circulates *inside* the block, heads and intake manifold until a third thermostat reaches 140 degrees and permits water to pass through the radiator. The water level should be kept to the bottom of the radi-

ADJUSTING EDSEL POINTS is exceptionally easy, for the distributor is up front, high and unobstructed (see photo at left). With the points open, loosen the locking screw, as below, and shift the fixed point until the specified .014" to .016" gap has been obtained.

# of an Edsel

of America's newest car



ator filler neck. Drains emptying the system are on the lower radiator tank and low down on each side of the block. The bottom heater hose should be removed when draining; otherwise the heater will retain its quart and a half of water. Edsel owners should know too that the engine "Cold" dash light is on when the water is less than 115 degrees, while the "Hot" warning brightens if engine heat exceeds 200 degrees. Both red ("Hot") and green ("Cold") will be lit when the engine is starting.

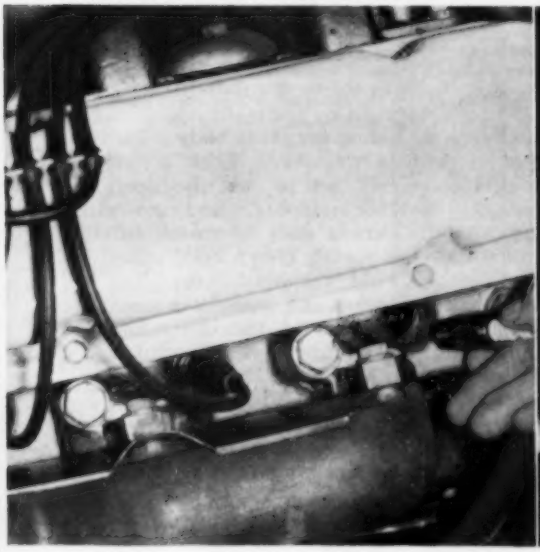
Happy days for Saturday mechanics begin with discovery of the distributor high up in front of the engine. Other parts are equally accessible.

Carburetion is by four-throat Holly or Carter carburetors, which have a screen bowl strainer, plus a fuel-line filter and sediment bowl. Clean both filters every three or four months and drain water from the sediment bowl just before freezing weather hits.

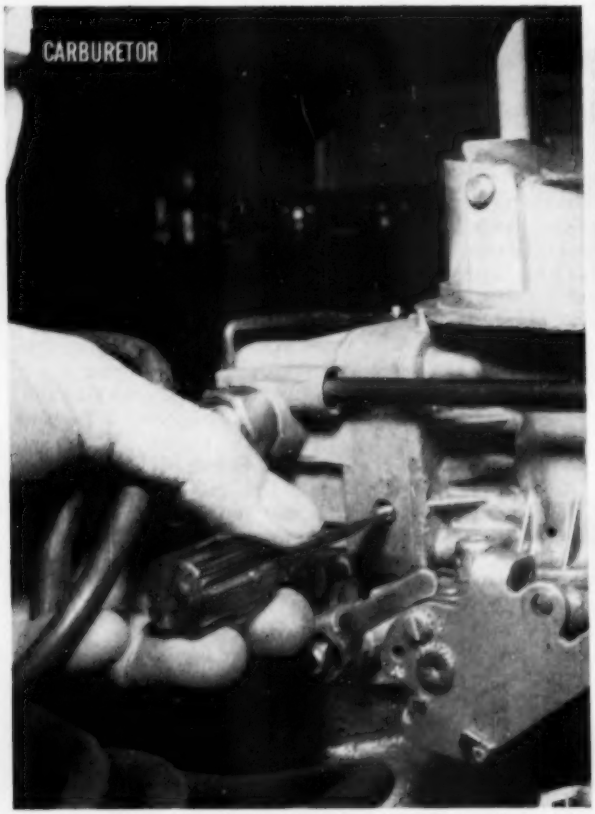
Adjustments to Holly carburetors include accelerator pump stroke, "hot" idle r.p.m. and mixture, and "cold" idle r.p.m. adjustment (see carburetor photos).

Adjustments of Carter carburetors vary slightly from the Holly. Idle-mixture screws are above the front of the carburetor base. Follow instructions for the Holly carburetor, continuing adjustment of idle-mixture screws and "hot" engine-idle adjustment until a smooth 475 or 500 r.p.m. is reached. To make a "cold" idle adjustment (after the engine is thoroughly warmed), position the fast-idle cam

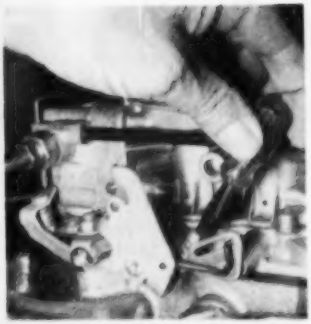
WELL-PROTECTED SPARK PLUGS require a wrench with a reach to remove them. Plugs should be gapped to .032" to .036". Wires have a resistance cover to minimize interference with the radio, and they are neatly held in place by brackets on the rocker-arm covers.



TIMING is at top dead center, but there are limit marks on the balancer between which timing may be set for maximum performance with varying local fuels. Connect the timing light to the No. 1 (right front) cylinder and disconnect the vacuum line when timing the engine.



IDLE MIXTURE on Edsel's four-barrel carburetor is adjusted by turning a brass screw on each side of the primary float bowl. Adjust the screws for maximum vacuum with the engine 20 minutes warm. If you have no vacuum gauge, turn the screws in until the engine runs rough, out until it rolls from richness, then slowly in again until the idle smooths out.



SET IDLE SPEED to 450 r.p.m. by turning the spring-wrapped screw on left side of carb. If a tach isn't handy, adjust for the slowest reliable idle with transmission in Drive, brakes set.

ACCELERATOR-PUMP STROKE on Holley carbs is changed with the seasons simply by shifting a screw from the No. 1 hole (summer) to the No. 2 hole (winter) in the throttle-shaft lever.

(on the side to which the accelerator linkage attaches) so the "cold" idle-adjustment screw is against the lowest (slowest) step. Start the engine and set the "cold" idle-adjusting screw so the engine idles at 550 r.p.m. The accelerator pump lever of Carter carburetors has three adjustments: an upper hole providing maximum fuel for extreme cold-weather operation; the lower hole to deliver a minimum amount for high altitude or extreme hot weather; the center hole for average use.

The Edsel body is spot-welded together as a separate unit, then tied to the frame by rubber-bushed body bolts which are torqued at 15 to 30 foot pounds. Door alignment is accomplished by loosening cap screws holding hinges to body pillars before shifting the door. Lock striker plates should be set to seal the doors against weather-stripping, and never adjusted to force a door to match surrounding sheet metal. Every 2,000 miles, Lubriplate should be applied to door-lock striker plates, rotors and door-check arms, while light engine oil is squirted into four holes at the door hinge joints. Lubriplate should also be applied to the lock dowel catch, auxiliary hood catch and to the luggage-lid lock. At the same time apply light oil to the hood hinge pivots (four points) and to the hinge pivots of the luggage lid.

Manual steering is the recirculating ball-and-nut type that requires only main-

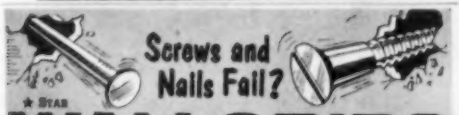
ROTARY MOWER—LEAF MULCHER

- Mulches 30" width! . . . *Twice* the power of ordinary mulchers . . . gets rid of leaves *fast!* . . . 5-HP.
- *New* Steering Sulky, *New* Optional Starter, *New* Rotary Cultivator — 23 attachments for year-round work. Snowblower, Snow Plow, Chain and Circular Saws for Fall and Winter jobs . . . *Finance Plan available!*

Write today for FREE 24-page "Power vs Drudgery" Booklet!

GRAVELY TRACTORS, INC.
BOX 984 DUNBAR, W. VA.

FIELD-TESTED SINCE 1922



★ STAR
WALLGRIPS
Hold Fast Where Nothing Else Will!

Expansion feature of Star Wallgrips enables you to securely fasten all kinds of fixtures (such as mirrors, pictures, cabinets) to hollow plaster walls, wallboard and thin panels of wood or metal—wherever ordinary screws or nails fail to hold.

Star Wallgrips are easy to use. Simply drill a hole, insert a Wallgrip and lock in place with screwdriver. Wallgrips remain secure. Fixtures can be removed quickly, easily for painting or redecorating. Write for FREE copy of "The Hang of Things," which shows how to fasten every kind of fixture to any type of wall.

STAR EXPANSION
142 Liberty Street (Dept. PS)
New York 6, New York

Send me a free copy of your booklet, "The Hang of Things."

Name_____

Address_____

City_____ Zone____ State_____

STAR WALLGRIPS *are available at hardware stores, chain stores and building supply dealers.*

It's set the automotive world on its ear . . .

Sealed Power's New STAINLESS STEEL* OIL RING

*U. S. Patent No. 2,789,872

It does things no other piston ring can do. It's an engineering first—permits unsurpassed oil savings and engine performance in today's high compression engines. Already being used as original equipment by a million-car-a-year manufacturer!

Here's what it does for you

1 Controls oil, saves oil as never before possible. Properties of stainless steel permit design advances previously impossible. No smoking under high vacuum conditions.

2 Will not corrode or sludge. Stainless steel finish can't corrode—sludge can't form. Engine continues to perform as manufacturer intended.

3 Stainless steel holds full tension at engine operating temperatures . . . actually hardens in use. This assures more than double the ring life you're accustomed to.

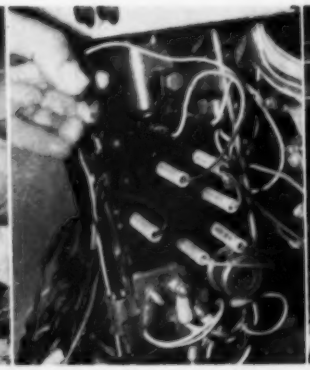
FREE OFFER

If you're interested in how to maintain your car properly, write for our illustrated manual, "Care and Feeding of Engines." It's yours for the asking. You'll find its illustrated pages informative, helpful, crammed with tips which may save you money. For your free copy, write Sealed Power, Dept. H-9, Muskegon, Michigan.

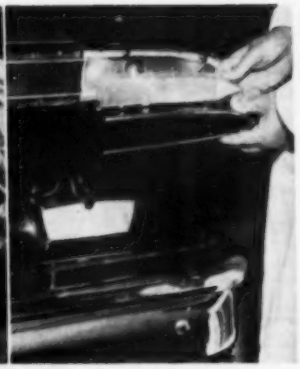
Sealed Power
PISTON RINGS

BEST IN NEW CARS! • BEST IN OLD CARS!

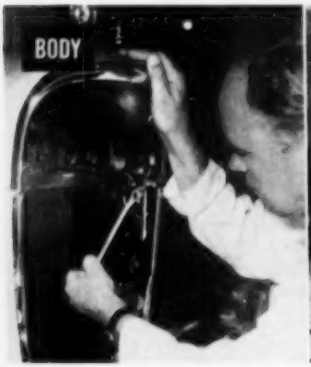
DUAL HEADLIGHTS are easily replaced after two body screws have been removed from the trim plate. The bulbs are marked No. 1 and 2, and distinctive sockets for each bulb make improper replacement impossible. Loosen only the three screws in the chrome ring.



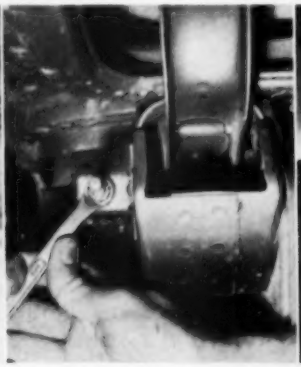
BLOWN FUSE creates no puzzle, with this junction box up under the dash on the driver's side. Each socket holding a fuse is labeled to show which circuit it protects, making it unnecessary to trace the wires or examine all of the fuse holders.



TAIL- AND STOP-LIGHTS have a dual lens: a white one to distribute the light, covered by a smooth red one. Screws through the flange of the red lens hold both in place. The license-plate bulb is the only one on the Edsel with a pull-out socket for bulb replacement.



HOOD IS ADJUSTED to match fender lines by loosening the hinge-bracket bolts behind the impact ring. The central grille, held by three cap screws, must be removed to make this adjustment. Rubber bumpers can be adjusted to control the closed height of the hood at the cowl.



TORSION BARS, instead of coil springs, lift the deck lid when the lock is opened. Turning the adjusting nuts clockwise as shown provides additional lift for the lid. Slotted holes in trunk-lid hinges permit shifting it to match surrounding metal.

RUBBER PADS in the bumper guards cushion the little jolts of maneuvering in tight parking spaces. One size fits all guards, and they are easily replaced. Bolts on bumper arms have eccentric heads. Loosen the nut and turn the head slightly to raise or lower the bumpers.

taining the lubricant (SAE 90 mild extreme-pressure) to the filler plug. All steering units have a rubber-bushed idler arm that assists wheel recovery to straight ahead (after cornering) through torsion action of the rubber as the idler arm twists from right to left. Do not lubricate this unit as oil deteriorates rubber and could destroy the recovery-assistance feature.

Two types of power steering are found in Edsels. The conventional linkage type (a factory or dealer-installed option) has its pump mounted on the block and the power assist attached to steering linkage beneath the car. The radical departure is integral power steering offered as a factory-installed option. Power assist is in a gear case at the lower end of the steering column. (It's in the location of

FOR YOUR HOME, YARD and SHOP PROJECTS

nichols
NEVER-STAIN
RUSTPROOF

ALUMINUM Nails

Guaranteed by Good Housekeeping

LOOK FOR THIS RED & WHITE DISPENSER

- Will never rust streak or stain
- Solid aluminum — no coating to chip
- Easy to drive — made of hard aluminum alloy
- Etched for great holding power
- Available in 10 popular types and sizes in reuseable plastic boxes

Also available in "Packaged-for-the-job" dustproof containers. At your hardware, building and lumber supply dealer.

nichols WIRE & ALUMINUM CO.
DAVENPORT, IOWA
World's Largest Manufacturer of Aluminum Nails

Next time... use

IT STAYS STUCK!

First and still the strongest liquid cement made, AMBROID *penetrates* surfaces to join parts forever. Withstands tremendous pressure! Water-proof. Hot fuel-resistant. Patch your canoe, repair delicate pottery, construct heavy models . . . *with confidence!* Use AMBROID . . . unsurpassed for all wood, leather, metal, fabrics, glass, pottery, china, plastic.

2 oz. tube 30¢ 4½ oz. tube 60¢

Craftsmen's choice since 1910

AMBROID COMPANY
Box 30, Weymouth 88, Mass.

PRECISION FEATURES • POPULAR PRICE

Get both in this NEW

Starrett

No. 436 0-1 inch

MICROMETER CALIPER

Balanced design, rugged construction, new specially forged tapered frame with deep throat, no-glare rust-resistant Satin Chrome Finish on thimble and sleeve, easy-to-clean black frame, quick-reading figures . . . these big Starrett features plus many more are yours at a very moderate price.

Models available with or without lock nut, ratchet stop or friction thimble. Graduated .001", .0001" or Metric. Also available in larger sizes up to 24 inches.

BIG NEW CATALOG—*FREE*

Describes and illustrates over 3000 Starrett Tools. Send the coupon.

STARRETT TOOLS are carried by leading Industrial Supply Distributors and Hardware Tool Stores.

THE L. S. STARRETT COMPANY
Dept. PS, Athol, Mass., U. S. A.

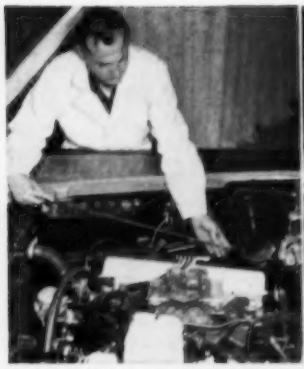
Please send my free copy of the big new Starrett Catalog No. 27.

Name.....

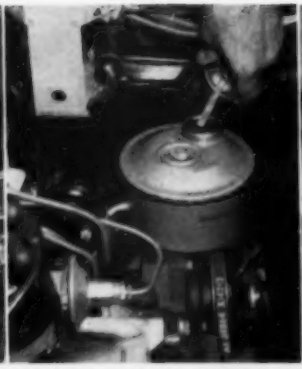
Occupation.....

Address.....

City.....Zone...State.....

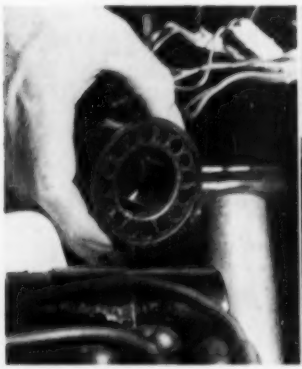


AUTOMATIC - TRANSMISSION FLUID is checked with dipstick at right rear of engine. With brakes set, run the engine for five minutes in Neutral, then shift through all ranges, ending at Park. Add type "A" fluid, if necessary, through the dipstick tube to raise the level.



POWER-STEERING RESERVOIR is at left front of the engine. Check fluid level with the small dipstick on the filler cap, being very careful not to get any dirt in the reservoir. Add type "A" automatic-transmission fluid to bring the level up.

ENGINE-OIL LEVEL *can* be checked by the dipstick, but it isn't necessary. There's a notch in the tubular stick below the required oil level, and if oil drops below the notch, a vacuum (kept constant by the windshield-wiper pump) will fall, lighting a dash signal.



CRANKCASE BREATHER CAP supplies filtered air to ventilate the crankcase. Dunk it in cleaning solvent every 2,000 miles—more often under dusty driving conditions. Allow the cap to drain or shake it dry, then wet the filter element with clean lightweight engine oil.

DRY-TYPE AIR CLEANER is standard on Edsels. Unscrew center wing nut and remove element every 4,000 miles. Tap it on a horizontal surface to shake trapped dust loose. Don't use solvent or high air pressure on it or you'll be buying a new one.

FUEL PUMP AND FILTER are now in plain sight on top of the engine. Their location makes it easier to clean the filter every 4,000 miles. Loosen the clamp screw by hand to remove the bowl and filter. If the element appears greasy or rusty, replacement is a good idea.

the power pump that Edsel discloses future plans. The pump is an integral engine part attached to the crankshaft. It's fairly easy to believe that, on future models, this built-in power source will operate windows, deck lids, hoods, doors, seats and other yet-to-be-announced devices.)

Checking lubricant in conventional transmissions is a mechanic's job during lube sessions as it can only be done from underneath. However, you can check the automatics yourself (see photo).

Engine oil should be drained at 1,000 miles (after break-in), then changed every 2,000 miles or three months, whichever is first. Oil should be hot and the engine just turned off before an oil change is made. This removes the maximum amount of sludge. Both engines

YOU GET MORE POWER, STRONGER GRIP with

P&C

PLIERS

For tough jobs you'll find P&C pliers hold up best. Scientifically heat treated jaws, tempered cutters, deeply milled teeth and extra firm-grip handles make P&C pliers America's favorites . . . more power in your grip.

Shop from the colorful P&C Tool Merchandisers, in more than 12,000 stores coast to coast. Send 10c for tool catalog.

P&C TOOL COMPANY

Box 5926, Portland 22, Oregon
Warehouse: Schiller Park, Ill.

Subsidiary of Pendleton Tool Industries, Inc.

INSULATE NOW

for as low as $67.60 cost for average attic

Do it Yourself in One Afternoon!

ZONOLITE®

VERMICULITE INSULATION

Easiest of all insulations to install . . . save as much as $100 installation costs. Cuts fuel bills up to 40%. Fireproof, rotproof, permanent.

LIFETIME GUARANTEE!

Zonolite is guaranteed to last the lifetime of the building in which it is installed. No further maintenance is ever required.

Write for ***FREE*** *How to Insulate* ***BOOKLET***

Zonolite Company, Dept. PS-97
135 So. LaSalle St., Chicago 3, Ill.

Please rush your FREE Booklet, HI-47 with details on How to Insulate.

Name .....
Address .....
City ..... Zone ... State .....

AT LUMBER OR BUILDING MATERIAL DEALERS

NOW! CUT ALMOST ANYTHING

with **WISS** "Mighty Midget" Snips!

No. V-13

ONLY $2.10! "Mighty Midget" Solid Steel Snips fit easily into your pocket or fishing tackle box. Make straight and curved cuts. At leading hardware and tool stores. Get a pair soon!

OTHER WISS SNIPS FOR HOME, FARM, AND PROFESSIONAL CRAFTSMEN

CIRCULAR and STRAIGHT CUT $2.80 and $3.80

Versatile as "Mighty Midget" snips. 10" model cuts 24 gauge metal; 13" model cuts 21 gauge.

REGULAR $2.35 to $3.50

For powerful straight cutting. Four different sized models. Good for all sheet metal work, 25-20 gauge.

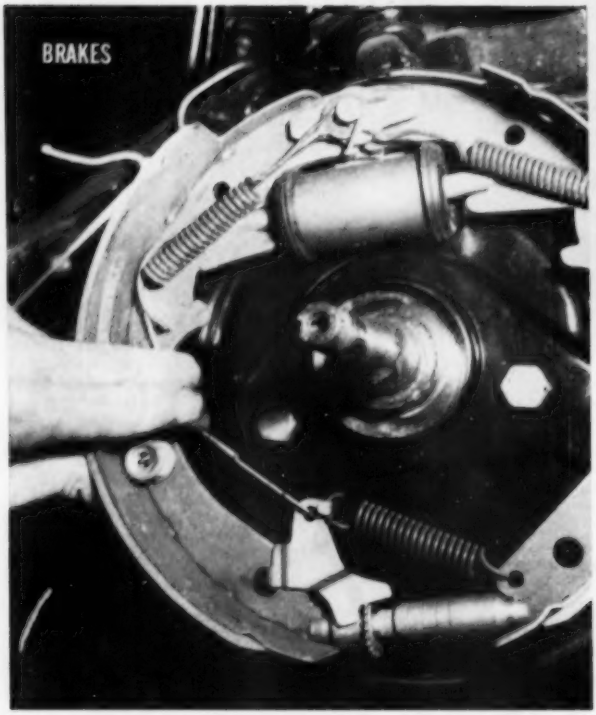
METAL MASTER M-3 $4.25*

Tremendous power! Only 10" long. Make intricate straight or curved cuts in 18 gauge metal, with half the normal effort!

* Slightly higher in Denver and West.
Vinyl handle grips optional and extra.

J. WISS & SONS CO., NEWARK 7, N. J.

WISS . . . always a cut above competition



BRAKE MASTER CYLINDER on all Edsel models should be kept filled to within ¼" of the top with heavy-duty brake fluid.

BRAKES ADJUST THEMSELVES: Applying them when the car is being backed causes the brake shoes to move slightly in a track. When they move, a cable lifts a ratchet beside the star wheel. If adjustment is needed, the ratchet will advance one notch on the star wheel as it lifts. Then, when the brakes are released, a stiff return spring pulls the ratchet down, causing it to turn the star wheel one notch. If the shoes are fully adjusted, they won't move.

hold five quarts of MS or MD oil with an extra quart for filter changing at 4,000-mile intervals. To remove Edsel's disposable filter, unscrew the entire assembly (from underneath the forward left corner of the engine) by hand. Coat the new filter gasket with oil, hand-tighten the can until the gasket contacts the adapter face, then advance the entire unit exactly one-half turn. Run the engine a few minutes and check for leaks.

Bendix Duo-Servo brakes have an almost unbelievable adjustment feature: back the car up, apply the brakes, and as the shoes move in their servo slot, they swing a ratchet arm that makes the adjustment for you.

Power brakes have a vacuum tank under the left front fender holding enough vacuum for three to five emergency stops. The only maintenance is to solvent-wash an air cleaner mounted on top of the large cylinder. It is replaced in a dry, non-oily condition. Should the engine stall on a steep grade, the parking brake should be set on the first application of the service brakes. When parking a car equipped with power brakes on an extremely steep grade, set the parking brake firmly *before* turning off the ignition. Before releasing the parking brake, be sure the engine is operating.

Cables to rear wheels of the foot-pedal-operated parking-brake are adjusted at the central equalizer by applying the pedal two clicks, loosening the forward check nut at the equalizer, then tightening the rear nut until the cables are just taut. Retighten the forward check nut to lock the equalizer in place. Release the parking pedal and rotate both rear wheels to make sure the shoes are not dragging.

Stainless-steel and chrome trim should be polished with a chrome cleaner, then waxed to retain a stain-free gleam. The baked-enamel paint on Edsel cars requires only washing to maintain its cleanliness and beauty. Abrasive cleaners should not be used on enamel. They so roughen the glossy surface that, instead of polishing, they will actually dull the paint.

If there's an Edsel in your future, you'll find that it was designed and built with the future in mind. END

FLAT SANDER

Oscillating orbital motion produces a fine finish on all woods, metals, and fibres where hand sanding is usually employed. Better built by SIOUX, the tools the professionals use. $49.95

FIND SIOUX FAST IN THE YELLOW PAGES

write today for Free Catalog

ALBERTSON & CO., INC.
SIOUX CITY, IOWA, U.S.A.

SANDS
WOOD
SATIN
SMOOTH

CHOOSE DEPENDABLE 5-RIB

CHAMPION

SPARK PLUGS

PAINTING IS EASY!

with the famous **BURGESS** *electric* **SPRAYER**

Just plug in and Spray:

- paint • varnish • enamel
- shellac • mothproofers
- garden sprays • water
- insecticides

PAINT 3 to 7 TIMES FASTER!

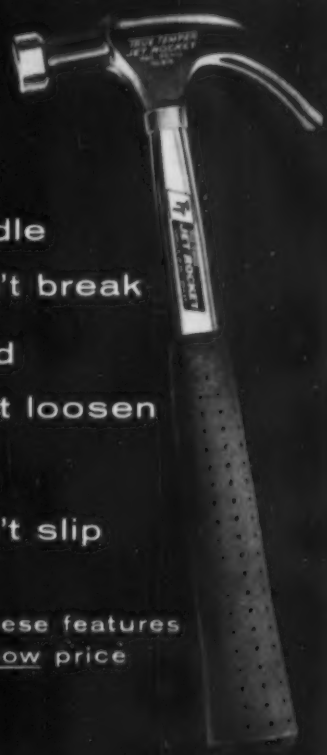
For the fastest, smoothest painting or spraying job you ever saw, try the Burgess Sprayer. Completely self-contained . . . just plug into regular household outlet, pull the trigger, and paint furniture, floors, walls, screens, cabinets, fences. Fine for mothproofing and garden spraying, too. Sapphire nozzle, handy spray adjuster, new convenient hanging hook, 25 oz. graduated jar. Easier to clean than a brush.

only **$12.95** AT YOUR FAVORITE DEALER

If not available locally send $12.95 for postpaid delivery. Money-back guarantee.

SEND FOR FREE BOOKLET
"HOW TO PAINT THE EASY WAY"

BURGESS VIBROCRAFTERS, INC.
DEPT. A-76 • GRAYSLAKE, ILLINOIS



handle
won't break
head
can't loosen
grip
won't slip

all these features
at a low price

Here's the most useful tool you can own – a JET ROCKET hammer by True Temper. You'll never break that tubular steel handle in normal use. The forged steel head can't come off. The cushion grip soaks up shock, won't slip. The JET ROCKET is perfectly balanced – a pleasure to use. See it now at your hardware dealer's. True Temper, 1623 Euclid Avenue, Cleveland 15, Ohio.

JET ROCKET hatchet and belt axe, too. Same tough, safe construction as the hammer.

TRUE TEMPER®

Finest quality in Hammers, hatchets, axes • Shears Shovels • Garden, lawn and farm tools • Fishing tackle • Golf-club shafts • Railroad products

How to Buy Good Retreads

This is something really worth knowing: It can cut your tire costs in half. Here are useful tips for sorting out the clinkers

By Robert Gorman

BEFORE you plunk down $60 to $160 on replacement footwear for your car, stop and ask yourself a question: Do you really need new tires—or just new rubber on your present ones?

There's a big dollars-and-cents difference, because good retreads, or recaps, can halve your tire cost.

It figures. Seventy percent of the cost of manufacturing a new tire goes into the casing. You can salvage a large part of that investment by replacing the 30 per-

Before you recap a tire, look for:

FABRIC CUTS or breaks. Small-hole patches are safe, but thumping may occur at high speed.

DEEP RADIAL CRACKS that penetrate to the cord. A few shallow cracks needn't doom a casing.

SEVERE WEATHER CHECKING. Rubber may be old, dried out. Capping can't make a bad tire good.

BULGES inside or out that show ply separation. A shop test for separation is essential.

cent of a tire that wears out, instead of throwing away the 70 percent that doesn't. Retreads are today's best buy in tire mileage.

But you can only get your money's worth out of good retreads—and there are other kinds. It doesn't pay to keep your tires through a second lifetime unless:

- They were of good initial quality—first line or better.
- The casings are only worn—not damaged. A tire should not be capped if it has been driven flat; if plies have separated; if fabric is cut, broken, or rotted; or if side rubber is badly checked or cracked.
- The job is done by a shop that backs its work with a cast-iron guarantee.

Truck and taxi operators, who retread a casing up to four times, have proved that it pays off in practice. Many say that retreads give mileage as good as that of new tires, sometimes better; other estimates range down to 75 percent of new-tire wear.

Retreads have other impressive boosters, including the men who buy tires for aircraft landing wheels, racing cars, ambulances, and police and fire-department vehicles. Acceptance for such jobs has helped to demonstrate that quality recaps are no longer anybody's poor relations. Retread men (or "treaders," as they usually call themselves) wish, in fact, that the public would stop coddling their product. Retreads can be used equally well on front or rear wheels, and are up to any service to which you normally put a car. If you must speed, re-

treads don't add at all to your danger.

Nevertheless, there are millions of car-wise buyers who won't touch retreads with a 10-foot pole. When World War II created both a rubber famine and a hungry market for unrationed tires, the treading industry mushroomed. On the whole it did a fair job of keeping cars rolling for the duration, but most people came to regard retreads as substitutes—and pretty poor ones at that.

It wasn't uncommon for poorly bonded caps to tear loose after a few miles, and no one in his right mind would risk driving war treads at high speed. To blacken the reputation of recaps still further, countless thousands failed because they were built on inferior casings.

With this spotty introduction to the motoring public, it's not surprising that tire treading nosedived after the war. But since then, several important things have happened to change the picture.

New-tire manufacturers have been steadily bettering their product, and sturdier rayon and nylon cords have been developed for body fabrics. So stronger, longer-wearing casings are now available.

Retreading know-how, materials and machinery have been greatly improved. And instead of being top-capped, as was once the rule, most tires are now treated to the more satisfactory full cap.

Such changing trends show up in a complete reversal of the wartime situation: Though unsatisfactory retreads are still with us, they now represent a small minority of the total output. As a result, treading has climbed back to an all-time high. This year, some 9,000 shops (including nearly 500 operated by new-tire companies) will turn out eight million truck and 24 million passenger retreads.

Despite high average quality, however, you still have to be on guard against clinkers, because every retread is individually processed, and many things can affect the result. The service and value you can expect will depend largely on the skill, experience, equipment—and integrity—of the shop that does the job.

Industry spokesmen acknowledge that there just aren't enough cappable casings to meet the booming demand. But rather than lose sales or raise production costs, some less ethical treaders process casings that properly should be scrapped.

And if he's not greatly worried about building his reputation, a retreader can shave his costs in other ways that do you no good. Tread rubber is manufactured in different qualities and thicknesses. By skimping on either or both, a processor cuts his costs—and your mileage.

Does it make any difference whether you have your own tires capped, or buy ready-mades out of stock? Not necessarily, but it does make sense to consider your own tires first. At the very least you have a good basis for judging their original quality and their present condition.

You can rule your tires out right away if you bought them as third—or even second-line—bargains. These tires may be

CAP or TREAD?...take your pick

SOME treaders call the application of tread rubber (or camelback) a "recap"; others prefer "retread."

Top cap—or top tread—is replacement of just the band of rubber that touches the road. Some people call this a recap to distinguish it from a retread or full cap.

Full cap—or full recap, or full tread—involves rounding the shoulders as well as the crown, and replacing rubber down to the scuff bar or curb ring. But some tire men call this a recap to distinguish it from a top tread.

Tire literature contains still other confusion. B. F. Goodrich, for example, uses the names "top cap" and "full recap" for types shown at left; it saves a third term, "retread," for a rarely used job in which the shoulders are buffed away and new rubber applied.

The amazing CIRCLE MASTER, a new patented attachment, will permit you to cut all circular shapes on any make bench saw. Simple to use, CIRCLE MASTER enables you to cut a perfect, clean and smooth circular shape. Cuts a diameter adjustable up to 30" on small saws, even bigger on large saws. You can make chairs, table tops, wheels, trays, lazy susans, stools, coasters . . . anything that calls for a circular shape. You can make cove cuts, beveled cuts, shoulder cuts, moulding cuts and many others depending upon blade used. You must be completely satisfied or your money back.
Send Check or money order. We pay postage.

ONLY $4.95

AMERICAN HOME TOOL CORP.
DEPT. 11 • 350 BROADWAY • NEW YORK CITY

AUTOMATIC RETOOTHER
MAKES NEW PROFITS
for HAND SAWS

Cuts new teeth in 50 seconds—any size 4 to 16 points. Old teeth fall off as chips. Easy to operate. A perfect job.

FREE! Write Now for Descriptive Literature

BURR MFG. CO.
8943-S VENICE BLVD. LOS ANGELES 34, CALIFORNIA

EASY to SPREAD

READY to USE!

Applying glue correctly is one of the most important steps in your woodworking project. Be sure parts to be glued are clean, dry and warm. Apply a thin film of Rogers glue to both surfaces; then clamp the joint to remove all air from the glued part. (This must be done for dovetails, tennons and dowels.) Allow enough drying time to permit adhesion to compensate for any shrinkage or expansion. Now you're sure of permanent strength. SPECIAL OFFER: A full-sized jar of Rogers glue; a set of easy project plans; a helpful "Rogers Book of Woodworking Shop Notes". Send 20c with your name and address to Rogers Glue, Gloucester, Mass. Ask for Rogers Glue at your local store.

Actual Tensile Strength: Over 3,885 lbs. per sq. inch. Good, Coverage — Just a Little Does a Lot.

ROGERS
the strongest glue - lasts forever
GLOUCESTER, MASS.

Install shelves, drawers and sliding doors with

THE FINEST YOU CAN BUY
KV FIXTURES

HARDWARE ASSEMBLIES

the easy way to do-it-yourself

K-V ADJUSTABLE SHELVES

You can build modern, sturdy, adjustable shelves quickly with K-V Shelf Assembly hardware. These steel electroplated assemblies come with easy-to-follow instructions for mounting shelves on walls or in built-ins.

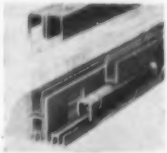
K-V DRAWER SLIDES

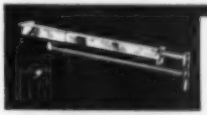
Easy-to-install K-V drawer slides won't stick or jam, give you noiseless operation. Five light to heavy duty models made of finest steel, including an under-drawer slide for drawers with no side clearance.

K-V 1300 Drawer Slide

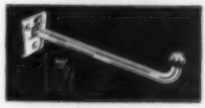
K-V SLIDING DOOR HARDWARE

You can install K-V Sliding Door Hardware without special tools. New improved steel track gives noiseless, free-running operation always. Complete installation kits in variety of sizes for wood, glass doors. 992 Roll-Ezy Assembly shown.





K-V 1 Clothing Carrier



K-V 3 Garment Bracket

AND MORE THAN 40 K-V CLOSET FIXTURES

let you remodel closets easily and inexpensively. K-V closet fixtures keep closets uncluttered and keep clothes looking their best. Can be installed with a screwdriver.

Look for K-V fixtures at leading lumber dealers, hardware and department stores.

KNAPE & VOGT MFG. CO.
GRAND RAPIDS, MICHIGAN

How a tire is recapped

FIRST STEP IN RECAPPING: Casing is checked for obvious flaws on tire spreader. Experienced men detect other faults by discoloration, texture, tiny ridges that can only be felt.

COMPRESSED AIR, injected between plies at Firestone plant, Bronx, N. Y., shows ply separation on tire that passed visual inspection. Other shops use heat test to expand pocketed air.

BUFFING (or rasping) removes the old tread, and gives the base an even, roughened surface for a good cement bond. Contour varies with size and make, must be checked with templates.

suitable for limited service when they're new, but the casings rarely have enough built-in strength to last out a second lifetime. And it is probably safest not to retread tires if they came on a dressed-up used car. Many of the worst tires going—including retreads of defective casings—are traded in and out of used-car lots.

But assuming that your tires came as original equipment on a new car, or that you bought new first-lines or premiums, they are likely to be good candidates. It helps if you took good care of them in the year or two they were wearing out their first treads, if they gave no serious trouble in that time, if you never drove them flat, and if the tread hasn't worn down to bare fabric.

The importance of original casing quality can't be overemphasized. But don't let yourself get snowed under by rumors about nylon versus rayon, or special perils in capping tubeless tires, self-sealers, or 14-inchers. Some shops have had difficulties with nylons and tubeless, but leading treaders now report that any sound casing can be successfully capped. Bear in mind, however, that after their first year or two of service, some tubeless tires begin to lose air-holding "integrity." If this shows up during a retreader's inspection, he may refuse to process it unless it will be used with a tube.

The time to retread your old tires is before the original grooves have worn away. You can then be sure there will be enough rubber left for a good undertread and a sound rubber-to-rubber bond.

Do you have to buy an extra pair—or set—of tires to ride on while you're having your old ones renewed? Not at all. On request, most retreaders will provide same-day service, whether you deal directly or through a gas station or other retail outlet. You just leave your car in the morning and pick it up in the evening with the retreads in place. Or if you don't want to leave the car, you can arrange to borrow tires for the time yours are in the shop. (Some treaders, however, charge an extra fee for mounting and demounting "loaners.")

A major advantage of having your own tires retreaded is that you can examine them for defects before applications of heat and paint cover the traces. If you have any worries about your own casings being switched for inferior ones when you

INVISIBLE GLOVE

ENDS PAINT-STAINED HANDS

Before you paint or start a dirty job in the house, garden or garage, rub Du Pont PRO-TEK hand cream on your hands and arms. It keeps sticky stains away from your skin . . . then washes off quickly, taking the grime with it. Get Du Pont PRO-TEK at drug, hardware, paint and auto supply stores.

Du Pont PRO-TEK

DU PONT Better Things for Better Living . . . through Chemistry

FIND a FASCINATING CAREER *in Painting and Decorating*

Craftsman's Manual and Textbook

Yes the official 1957 edition of

"Painting and Decorating Craftsman's Manual and Textbook" is now available for young men going into the Painting and Decorating field. The manual that is used by apprentices, journeymen and contractors over the entire country. The new 417 page revised edition gives the latest information on Paints, Pigments, Color Pigments, Binders, Thinners & Solvents, Synthetic Resins, Preparation of Surfaces, Paint Formulations, Other Basic Coating and Finishes, Tools, Procedures, Paint Failures and their remedies, Estimating, everything a young man should know when going into the painting and decorating profession. The journeyman can learn how to improve himself, improve his work, Make his work easier. The contractor can better his business and make a better profit with the information in "Painting and Decorating Craftsman's Manual and Textbook", the manual that keeps you abreast of the times. A textbook acclaimed by authorities in the field. Order one or more copies at $3.00 each.

PAINTING AND DECORATING CONTRACTORS OF AMERICA, INC.
Dept. T-4, 549 N. Michigan Ave., Chicago 11, Ill.

DO IT YOURSELF
It's Easy With . . .

Soldering's really a "cinch" . . . when you use time-tested, reliable KESTER . . . available everywhere.

FREE! "Soldering Simplified" . . . 16-page how-to-solder booklet. At your dealer or write direct.

KESTER SOLDER COMPANY
4254 Wrightwood Avenue Chicago 39, Illinois

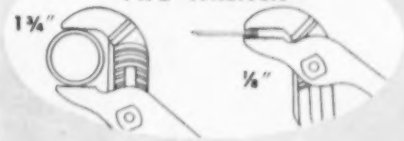
the plier you'll reach for 9 times out of 10:

CHANNELLOCK

No. 420

***because no other plier does so many jobs so well**

GRIPS LIKE A PIPE WRENCH



Mechanics tell us that our Channellock No. 420 is the handiest plier of them all . . . the plier they reach for more often than any other. They like its all 'round usefulness . . . its pipe-wrench grip . . . its big jaw-opening . . . its streamlined design for hard-to-get-at jobs. And *you'll* like Channellock for the same reasons. Ask your hardware man for a Channellock 420.

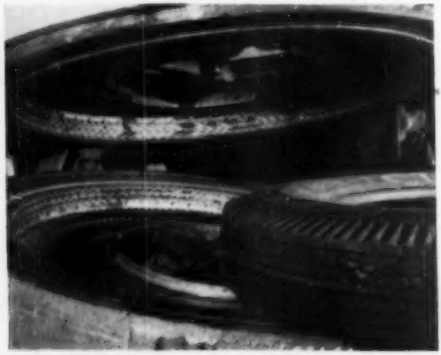
BE SURE IT'S A GENUINE CHANNELLOCK

CHAMPION DeARMENT TOOL Co. MEADVILLE, PA.

How a tire is recapped [*Continued*]

TREAD RUBBER, or "camelback," is applied after sprayed or brushed-on cement has set. Here operator centers the strip by hand, then uses a roller to squeeze out air for a tight bond.

CURING BAG is inserted in built-up tire and locked in. Tire then goes into clamshell mold, and curing bag is inflated to press the rubber into the groove-forming ridges of the matrix.



VULCANIZED TREAD is very similar to new tire's when curing time and temperature are carefully controlled. This mold uses steam to vulcanize rubber; others are heated electrically.

turn your back, copy the serial numbers off the sidewalls.

What happens if you decide not to use your tires, or if inspection shows up faults that make one or more unsuitable for capping? You can still take advantage of retread economy by buying tires out of stock. Present trends favor this method of buying by about two to one, but since it leaves you with fewer clues to the condition or quality of the original casing, you should shop with a little more care.

You might take an extra-close look at price-promotion retreads offered by dealers who don't take your old tires in trade. Because their suppliers have to scrounge for casings, they may be tempted to use some that aren't up to scratch.

There's no way you can see the difference between cheap rubber and the better, longer-wearing kind, but you may be able to tell whether you are being short-changed on quantity. According to the standards of the Tire Retreading Institute, a leading trade association, minimum groove depth should be no less than 10/32″ on passenger tires; many shops now use 11/32″ or 12/32″ molds for regular tires, and up to 16/32″ for snow caps. You can check tread depth by taking along a narrow ruler or probe when you shop.

However, this measurement doesn't give you any information about the depth of the undertread, or the quality of rubber or workmanship. So your best protection is to know your retreader or dealer.

Don't settle for less than the equivalent of a new-tire guarantee against tread and ply separation and other basic defects. You should be able to bring a tire back for adjustment if it's a thumper.

Fairly standard contracts cover free replacements within a three-month period, and proportionate adjustments (based on time or mileage) on tires that go bad after that. However, many treaders guarantee against defects for the life of the tire, and some will replace a tire that fails for any reason—including tube blowouts, glass cuts, and other hazards.

With that kind of guarantee, backed by a good reputation, you can hardly go wrong. Tens of millions of good retreads have proved themselves in every kind of service. Reliable treaders say the only thing that distinguishes them from new, first-line shoes is that they cost only half as much. END

FREE! "FRIENDLY HOME IDEAS"—85 photographs, many in color, feature traditional and contemporary ideas for building, decorating and remodeling using cheerful Western Pines. Write for your FREE copy to WESTERN PINE ASSOCIATION, Dept. 210-L, Yeon Bldg., Portland 4, Oregon.

Space to put things—work desk, too!

All in this easy-to-build Western Pines unit

It's practically a home office, all in one. And what a breeze to build!

Clean-cutting, soft-textured, carefully seasoned Western Pines make for pure pleasure in the workshop.

And nothing takes paint, stains and varnishes more beautifully than these handsome, easy-to-work, economical woods.

See your lumber dealer for an estimate.

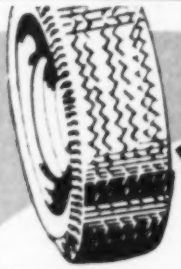
The Western Pines

Idaho White Pine
Ponderosa Pine
Sugar Pine

and these woods from the Western Pine mills
WHITE FIR · INCENSE CEDAR
RED CEDAR · DOUGLAS FIR
ENGELMANN SPRUCE
LODGEPOLE PINE · LARCH

are manufactured to high standards of seasoning, grading, measurement

TODAY'S WESTERN PINE TREE FARMING GUARANTEES LUMBER TOMORROW



HIGH TRACTION-SAFETY · TESTED THREE WAYS · NEW TIRE RUBBER · ROAD HAZARD GUARANTEE · 40% LOWER

NEW TIRE PERFORMANCE WITH QUALITY RETREADS

The experts say that a retread tire is as good as a new tire, if the original casing was in A-1 condition. Kay Tire casings are the very best that money can buy. They are tested 3 ways. Only after rugged machine and hand inspection using 3-cross check techniques, do casings qualify for the Kay retreading process which adheres the very best in top-grade rubber. As a matter of fact, Kay uses the very same rubber that is found on new premium priced original equipment tires.

Not only is the tire as good as new—but thousands of satisfied customers will tell you that the Kay Retread is superior to any new tire. Superior—because the Kay Tire safety tread design reinforces sidewalls to prevent radial cracks, and offers high-traction sure-gripping power. Here is a retread tire that is tops in quality, peformance and safety—but low in price . . . up to 40% lower than standard industry list prices. Price 'em—compare 'em.

Note: Send check or money order. No C.O.D. please.
* All prices F.O.B. Mineola, N. Y.
Add local sales taxes if any

SIZE	PRICE	SIZE	PRICE
640 x 15	$ 9.00	760 x 15	$11.95
670 x 15	$ 9.95	800 x 15	$11.95
710 x 15	$10.95	820 x 15	$11.95
600 x 16	$ 9.95		

In addition, you get an insurance policy giving an unconditional road hazard guarantee up to 20,000 miles. Send today for your 3-way safety tested Kay Retread Tires.

KAY TIRES, Inc.

Kay Tires, Inc., 30 Windsor Ave., Mineola, L. I., N. Y.
Please send me_____ Tires _____Size
(number)
Total remittance enclosed $_____
Name_____
Address_____
City_____State_____

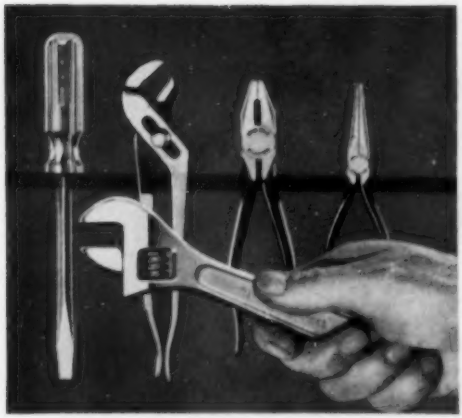
New for Your Car

1. Spray Protects Battery. You can keep your battery up to peak output by washing it with baking soda and water and scraping terminals clean every few thousand miles. After you dry the battery and reconnect the cables, a coating of this battery-terminal aerosol spray is designed to retard the formation of acid salts and prevent corrosion at cable ends. When sprayed on the battery, the chemical is said to prevent electrical leakage between cells and electrolyte seepage.

2. Leather Is Cut to Pattern. Leather upholstery is now available in seat-cover shops for your car's seat and door panels. A new plan enables a local seat-cover dealer to make a set of paper patterns to your design. Working from these, tannery craftsmen cut pieces of the specified color and quality from hides. Upon receiving the parts, the seat-cover man removes the old upholstery, and fits and stitches the leather into place. Before the pattern system was set up, this work was done only by a few custom shops.

More information *about the products shown on this page can be obtained from: 1. Plasti-Kote, Inc., 9801 Harvard Ave., Cleveland 5; 2. National Assn. of Auto Trim Shops, 1123 Broadway, NYC. 10; 3. Monroe Auto Equipt., Monroe, Mich.*

3. "Helper Springs" Level Car. You can cram the entire family plus several hundred pounds of luggage into your car when you have these Load-Levelers to keep the car from sagging low on its rear springs. The helper springs are combined with heavy-duty shock absorbers, which automatically control the ride under all load conditions. When the car is light, the shock absorbers dampen spring action in the usual manner, providing a smooth ride without the stiffness that is sometimes experienced with extra-load devices. To install, you remove the existing rear shock absorbers and bolt on the new units, which have identical end fittings.



Home Hobbyist Tools by UTICA

Wherever you see the most useful of all modern hand tools at work you'll find Utica pliers, wrenches, screw drivers, etc. Hallmark of quality in hand tools since 1895! Precision made. Backed by famous guarantee. At leading hardware stores everywhere!

UTICA DROP FORGE AND TOOL DIVISION
Kelsey-Hayes Co., Utica 4, N.Y.

"Use Utica . . . the tools the experts use"

Low Cost

HEAVY-BODIED KLEAN-STRIP

Non-inflammable paint remover

Fast • Clean • Safe

The Klean-Strip Co., Inc. • P. O. Box 10084 • Memphis, Tenn.

Automatic Saw Set...

MAKE EXTRA PROFITS!

Set 400 teeth per minute on hand or band saws, 4 to 16 point, with the BeMaCo Automatic Saw Set. Fast, accurate, true **hammer-anvil action** sets teeth uniformly, eliminates tooth breakage. Used profitably by saw shops and manufacturers everywhere. Every machine positively guaranteed!

Write for details—today!

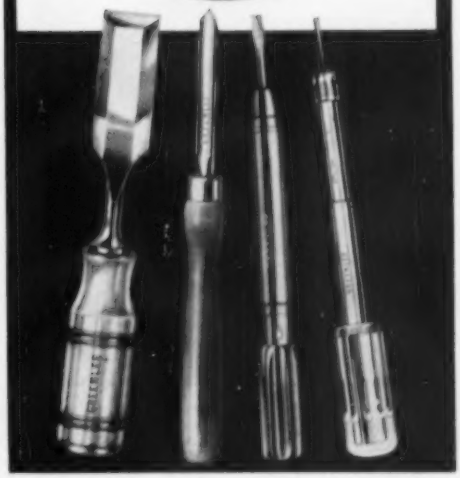
Saw Machine Division 30-S

BEAVER MFG. CO.
PO Box 434
800 ISIS AVENUE • INGLEWOOD, CALIF.

high-quality hand tools for finer workmanship

Do the job easier and better with GREENLEE tools. Auger bits, electric-drill bits, other boring tools, chisels, gouges, spiral screw drivers, push drills, and many more. All expertly made of top-quality materials for long life, fine results. At leading hardware and building supply dealers. Write for folder, Greenlee Tool Co. 2129 Columbia Avenue, Rockford, Illinois.

TOOLS FOR CRAFTSMEN
GREENLEE



Hi-Fi and Electronics

Why Buy a Tape Recorder?

Hi-fi fan? Family man? Gadgeteer? Here are a few of the uses you'll find for the machine that makes its own sound

SOUNDS OF TODAY will make interesting listening tomorrow. Who can say that the growl of this passing diesel locomotive won't become as rare as yesterday's thundering steam exhausts?

This year, half a million Americans will buy home tape recorders. They, and 1,500,000 earlier customers, will also buy enough magnetic tape to reach 12 times to the moon. How can 2,000,000 tape recordists justify spending from $100 to $2,000 apiece for this electronic gadget? We asked this question of a man who's convinced that these little boxes with a memory for sound are an indispensable part of modern living. Here's his answer:

By Henry B. Comstock

MY FIRST brush with recorders came a year ago when my teenage son decided he couldn't live without one. He reminded me that he and a high-school buddy with a tape recorder had just rated a couple of A's for a history project that they had submitted the modern way—on tape. It began with a stirring tuba blast, followed by an Edward R. Murrow-like voice intoning: "Ancient Rome was more than a city; it was a way of life."

"I blew the horn," Bob said modestly.

When that sales pitch failed, he and his friend Dick tried another. They knew my soft spot—trains. I had once edited a railroad magazine, and will still go miles to watch the flanged wheels roll.

With an assist from our local station agent, Bob and Dick ran an extension cord out of his telegraph bay, and made a recording of a diesel plodding upgrade with a mile-long freight. When they turned it on in our living room, the windows rattled with the drub of wheels on rail joints and the groan of straining drawbars. The only thing I missed was the

ANGLING FOR A FEW WELL-CHOSEN GURGLES to add to the family sound album is part of the fun. Dud footage isn't wasted. It's snipped out, spliced on the end of the spool and used again.

bluster of a steam locomotive at the head-end, and the wail of an honest whistle.

Bob had counted on that. He reminded me that there were still a few far-off spots where such a recording could be made. I threw up my hands. I knew when I was licked.

But not my wife.

"I can get along without boxcars running through the house," she said. "What we really need is something that will make our records sound less scratchy."

"***Those records are ruined*** already," Bob assured her. "That's the trouble with records—they wear out." Then, in an aside to me: "This situation calls for prerecorded tape."

The next day he and Dick were back with Dick's recorder. They also had a bright-colored carton of tape and a length of wire that I've since learned to call a patch cord. While Bob threaded the tape to the receiving spool, Dick plugged one end of the cord into a jack on his machine, and anchored the clips at the other end to the terminals on my own hi-fi speaker enclosure.

"Doing this," he said, "cuts out the

CANNED COMMENTARY for showings of travel slides doesn't try to prove that every picture is worth a thousand words. Often, a bit of dubbed-in music will take care of continuity.

little speaker cones on the recorder. You'll think you're in Carnegie Hall."

We did. The music was unbelievably brilliant and crisp, without a trace of background noise. As *Eine Kleine Nachtmusik* slid over the playback head you could almost see the periwigs bobbing.

"You buy it like old-fashioned LP records," Dick shouted over one crescendo. "Fifty manufacturers to choose from. More than 1,100 selections—opera to bebop. Language lessons, poetry and dramatic readings, too."

My wife was impressed.

"How much music is there on a tape?"

"Seven-inch spool lasts an hour, if you buy it for a dual-track machine like mine. That means you play along half the width of the tape for 30 minutes, then flip the spool and play along the other half."

Dick should have stopped right there. He didn't. "Of course, pre-recorded tape still costs a good bit more than records. But the price is bound to come down."

"What would we pay for a spool like this?"

"Eight ninety-five."

"Why, that's more than twice the price of an LP record!"

"Sure. But this tape is good for hundreds of playings without a sign of wear. If it breaks, you just stick it together with splicing tape. Not even a click to show where you put the patch on."

At this point Bob cut in. He had played enough football to know that you change your strategy when you're being pushed back up field.

"Personally," he said, "I'm all for saving money by making our own musical

Just pull the trigger... spray paint!

The easier, better way to paint! Job's done in minutes. Finish is smooth, flawless. Speedy Sprayer is a real *professional tool*, favorite of craftsmen for over 35 years! At stores everywhere. 890 Outfit, including gun, hose, less motor, only $39.95

Speedy Sprayer *Wheel it to the job!*

FREE! "How to Spray" booklet and literature. Write!

WHEEL KIT $7.50 EXTRA

W. R. BROWN CORP., 2637 N. Normandy, Chicago 35

---

at a price YOU can afford | **TRANSMIX UTILITY MIXER**

Mixes while transporting • Dumps hydraulically • Attaches in minutes • No holes to bore • No gears • 1 or 1½ bag capacity • Eliminates wheelbarrows • Unconditional guarantee • For complete FREE folder, write:

UNIVERSAL PULLEYS COMPANY
337 N. Mosley, Wichita, Kansas

Hanging a door is simple...

with McKINNEY Non-Mortise Hinges

Installs directly on door and jamb. No chiseling or cutting. A screwdriver is all you need to do a professional job. Heavy gauge steel . . . choice of finishes. Send for literature.

McKinney Manufacturing Company
1715 Liverpool Street, Pittsburgh 33, Pa.
Please send Non-Mortise Hinge literature to:
Name_____
Address_____
City_____ Zone_____ State_____

---

if you have to glue it... LET ELMER DO IT!

Repair or build quickly with strong ELMER'S® GLUE-ALL

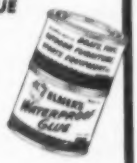
Be a real home "do-it-yourselfer." Build this fold-away work bench easily from Easi-Bild pattern #576 with Elmer's Glue-All. It's easy to apply, fast drying. Glue-All is also ideal for dozens of other uses around the home. Bonds any porous material such as wood, pottery, paper or cloth.

Send 50¢ in cash or money order for full-size Easi-Bild* Fold-away Bench Pattern No. 576 to Elmer's Pattern Dept., P. O. Box 26, Pleasantville, N. Y.

*T. M. Reg. Easi-Bild Pattern Co., Inc.

Get a completely waterproof bond with ELMER'S® WATERPROOF GLUE

It's the glue that boating experts use. Apply on any joint subject to water, weather, acids or alkalis. Super bond is stronger than wood itself!



Bond plastic laminates or plywood wall panels with ELMER'S® CONTACT CEMENT

No clamps, nails or presses needed to do professional job quickly. Highly resistant to heat and water. Available in regular or *non-flammable* type to meet every need.

IF IT'S *Borden's* IT'S GOT TO BE GOOD!

The Borden Company, Chemical Division

©1957, The Borden Company

FAMILY MEMO TAPE tells Mary, just home from school, that her aunt will be back from shopping by the time the hall clock strikes three, and what's in the refrigerator for a snack.

recordings. We can pick up anything we want from radio or TV."

It was a good try. But my wife shook her head. "Scratches or no scratches," she said, "we'll stay with records."

During the next few weeks I did a bit of researching. I learned that almost nobody buys a tape recorder for as obvious a reason as replacing a phonograph. There has to be a gizmo—some highly personal angle that may seem unimportant and even zany to the other fellow. Here are a few samplings.

A family was going on a trip. They knew from experience that their dog wouldn't eat when left with neighbors. So they bought a tape recorder, whistled into it a couple of times and said: "Good boy; come eat your yummies." It worked.

An entomologist bought his to eavesdrop on insect sounds. An amateur poultry farmer bought one so he could record a rooster's crowing at sunrise, and play it in his hen house at time-switch-controlled intervals throughout the night.

With this information, I dealt a fast card off the bottom of the deck. We had a little niece and nephew living with us. Three-year-old Johnny still felt that a woman's place—his aunt's, at least—was in the home. An hour after we made our first attempt to leave him with a baby sitter, we were back home.

I waited until my wife had exchanged her party finery for a housecoat.

"You know," I said, "I'll bet a tape

Two good names are always better than one

When you buy a portable electric drill look for the name JACOBS on the chuck. It is your extra assurance of top tool performance.

An electric drill is no better than its chuck...the point where the drill's power is put to work. Many heavy duty operations are performed with attachments which are held in the chuck, so a tight, accurate grip — a JACOBS grip — means better work done easier.

All leading manufacturers of portable electric tools equip their drills with Jacobs Chucks. Look for the name JACOBS on the chuck when you buy. Two good names are always better than one.

The Jacobs Manufacturing Co.
West Hartford, Connecticut

WELD **BRAZE** **SOLDER** **CUT**

4 WAY WELDER

ONLY **$14.75** f.o.b. factory

Complete with Twin Carbon Arc Torch and accessories . . . to handle all metal-craft work.

Acclaimed by thousands of Homeowners, Mechanics and Hobbyists as the welder of 1001 uses. Easily operated from properly wired 110 volt AC or DC line. **The ideal gift with a life-long use . . .** Order today on 10 day money back guarantee.

FOUR-WAY WELDER CO., Dept. F3-J
1810 S. Federal St. • Chicago 16, Ill.

10" TILT/ARBOR SAW
BUILD-IT-YOURSELF from GIL-BILT KITS-PLANS

Sturdy wood, steel, and aluminum construction. NEW DEPARTURE ball bearings. Capacity and performance of floor saws selling for $150.00 and up. Plans, all metal parts in kit with 10" comb. blade $28.00, less blade $22.95. F.O.B. St. Louis. Detail PLANS-PATTERNS only $1.00 postpaid.

Build-it-yourself 12" and 18" Bandsaws, 6" Belt Sander, Shaper. Simplified plans, build easily with hand tools only. Advertised and sold for 10 years, over 33,000 units in use. Money back guarantee. FREE CATALOG.

GILLIOM POWER TOOLS, Dept. 70-J, Lambert Field, St. Louis 21, Mo.

GIGANTIC SAVE-TO-70% MAIL SALE WAR SURPLUS EXCESS INVENTORY BANKRUPT STOCK

Battery Winch

• Powerful fully reversible, ball-bearing gear reduction winch, 1000-2000 lb. pull. Use on 6 or 12-v battery. Holds 40' of 1/4" cable. For trucks, docks, boats.
Govt. cost $280. FOB $46.75

Electric Pump

• Runs on 12 volt battery. Centrifugal type. Many uses.
Govt. cost $64 . . . . . Ppd $9.95

Dial Phone

• Modern dial type. Use for extension, private line, etc. Self contained transmission circuit easy to connect.
List $25. . . . . Ppd. $9.95

Hydraulics—Pumps—Compressors

• Hydraulic Cylinders 1½"x6"	$ 4.89
• Hydraulic Pump Elec.	13.95
• Stainless 12x24 in. Air Tank	16.95
• Air Compressor, 150 lbs.	19.95
• Pressure Regulator	3.95
• Pressure Gauge (100 lb.)	1.89
• Industrial Paint Gun	11.95
• Air Tank 10x18 in.	8.79
• Irrigation Pump, 3½"	49.71
• Irrigation Pump, 1½"	24.61
• Astronomical Telescope	38.50
• Finest 7x50 Binoculars	26.81
• 115-V 800-Cycle 1200-W Generator	13.91

Speed Reducer

• Variable hydraulic. Speed zero to 750 rpm. Up to 1½ h.p. Use midget cars, band saws, etc.
Govt. cost $400 FOB $47.81

Power Plants

• Amazing buys. Army and regular plants and generators. Both DC and AC units. Low as $59.50

Electric Car Motor

• Use golf or boys electric car. Geared 140 to 1. Run 6 or 12 volts. Easily reversible. Full instr. Wt. 34 lbs.
Govt. cost $250 . . FOB $19.46

Ice Air Conditioner

• Uses canned ice. Has twin turbine blowers. 3 models: (1) 110-v AC, (2) Car 6-v, (3) Car 12-v. Natl. Adv.
$39.50. SALE FOB. $14.97

SPECIAL OF THE MONTH!

Electric Clock Timer

• Finest 115-v 60-c self-starting electric clock-timer. Shows exact time also will sound built-in alarm signal at some preset time. Size dial 3½". Wt. 1 lb.

• Ideal for building into desks, furniture, radio-TV sets, laboratory units, etc. Attractive white dial with red minute numerals and black hands. Easy to mount.

• Made by leading company for special Govt. application. A 4-star buy!
List $12.50. Prepaid Sale $2.89

Outstanding Bargains

• Plastic Water Pipe ¾" per ft.	$ .12
• Gear Reduction Unit 85-to-1	8.49
• Gear Reduction Motor, 54-to-1	4.97
• Hand Winch, boats, trucks	8.95
• Farm Weed Spray Outfit	69.95
• Machinists Calipers in case	3.19
• Hydraulic Hand Pumps	10.95
• Army Prismatic Periscopes	1.95
• Furnace Blower with motor	21.95
• Fish and Worm Shock Generator	3.89
• Govt. Jungle Hammock-Tent	6.95
• Farm Magneto 5-Bar Phones	12.95
• Air-Power Tree Trimmer	8.50

Order from ad or write for new free catalog.

FREE CATALOG

BURDEN SALES COMPANY
831 "O" St. LINCOLN, NEBRASKA

TAKING SOUND OFF TV is a cinch. Action on screen provides cues for precise recording. With radio the job is harder; to play safe you pick up more than you want, edit selections later.

SLURRED OR SOLID? Music-practice tape is an impartial teacher, as quick to pick up a slip of the lip as to give credit, when it's played back, to a really hep flight of triple tonguing.

recording of your reassuring voice would handle situations of this kind. Also, have you noticed how often little Mary has been saying 'yeah' lately? If she could hear herself, she might reform."

My wife sniffed. "She got those 'yeahs' from you." Then: "But it *would* be nice to keep a record of those two on tape. The way they say grace together, and those little songs of Mary's. She has a good voice and perfect pitch."

A week later we bought our recorder.

It cost us less than $150—a price that would make fanatical recordists raise eyebrows. But I like to think that, within limits, what you get out of a rig—whether it's a tool, camera, or tape recorder—is pretty much up to you.

Our machine has the basic capabilities for good performance: two tape speeds (one for run-of-the-mill stuff, the other for fine sound), a "magic-eye" tube to determine the right recording level, an odometer that pinpoints individual sections of tape for erasure or playback, and two input and two output jacks.

Kill-joy audiophiles tell me the frequency range of our recorder falls a little short of hi-fi phonograph perfection. That didn't bother me after I learned that, having passed the age of 45, I probably couldn't hear those top sounds anyway. But if you're really fussy, you can buy recorders that out-span the frequency range of the best LP records. And if you want the ultimate in reproduction, less than $500 will buy a binaural tape machine. With it, you'll have more than 1,000 pre-recorded stereo-sound selections to choose from. These models will also record and play back regular monaural sound.

During the past nine months we've discovered, as most tape-box owners do, that the biggest return we get is good music of our own choosing. We have some prerecorded tape. But that's like an amateur photographer buying picture post cards; the big boot comes from shooting your own.

Let's say there's a TV spectacular coming up. With our recorder patched in behind the speaker we can have our cake and eat it, too, for the unobtrusive tape

NEXT MONTH: *Want to repair your own ailing TV? More often than not, you can! For tips on how to diagnose and remedy your TV problems, just tear out and save this October Popular Science booklet:*

"Before You Call the TV Repairman"

Get right down to bare wood fast with the *guaranteed* paint remover—Strypeeze—the fastest selling paint remover in America.

Available at paint and hardware stores everywhere

Kwikeeze cleans all brushes fast! Even the hardest brush softens in a jiffy with KWIKEEZE. No rinsing, no mess. Perfect for all bristles.

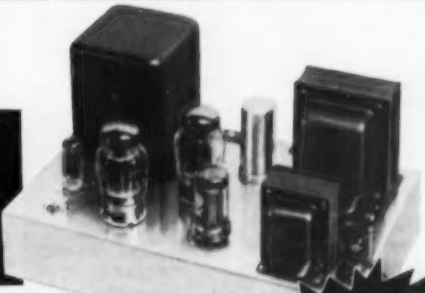
SAVOGRAN
Dept. 903, 25 Huntington Ave., Boston, Mass.
Please send me new illustrated booklet, "How to Remove and Restore All Finishes". Enclosed find 25¢.

*Name*_____

*Address*_____

LIMITED QUANTITY
below manufacturer's cost!

60 WATT AMPLIFIER



MusiCraft Special

MusiCraft capitalized on a once-in-a-lifetime opportunity. Because this sale is limited, act fast. Look at the price . . . Check and compare the specifications . . . And share our enthusiasm! First run, quality components and construction.

SPECIFICATIONS

- **IM Distortion**....Less than 1% @ 60W.
- **Harmonic Distortion**....Less than 1% 20 cps. to 20,000 cps.
- **Frequency Response**....±0.5DB, 20 cps. to 20,000 cps. ±1DB, 7 to 70,000 cps.
- **Sensitivity**....1.5 volts rms. for 60 watts.
- **Damping Factor**....choice of 15 or 30 by a switch.
- **Hum and Noise Level**....85DB below 60W.
- **Hum Nullifier Control** which compensates for aging or replaced tubes.

FEATURES

- Chrome plated chassis
- Choke filtered power supply
- Octal socket for preamplifier power connection (wired for Heathkit, Dyna-kit and other preamplifiers)
- Fuse receptacle on chassis
- Heavy duty power cord
- Biased filament supply
- Tubes: 2-6550, GZ34, 6BA8A
- Completely assembled, wired, and tested
- Dimensions—9" x 14" x 8" high. Shpg. Wt., 31 lbs.

IN FACTORY SEALED CARTONS
manufactured to sell for
$169.95

NOW
$74.95

Mail Orders Filled Promptly
For more high fidelity bargains write for MusiCraft's brochure.

MusiCraft 48 East Oak St., Chicago 11, Ill., DElaware 7-4150

What's Coming in Tape Machines?

WHETHER you're a hi-fi fan or a casual phonograph listener, you may be switching from records to tape sooner than you think. Four main things, say the experts, will put tape recorders into millions of homes within the next few years:

- Lower tape speeds will slash costs by putting two to four times as much time on each reel. Professional machines move tape at 15 inches per second; hi-fi tapes for home playback are now paced at 7½ i.p.s. To get equal quality at lower speeds, the magnetic-recording-head gaps across which tape passes are being narrowed to a fraction of a hair's width. Experimental laboratory machines are putting out hi-fi sound at 1⅞ i.p.s. At this speed, a 600-foot (five-inch diameter) tape reel could hold as much as two hours of music.
- Cartridges that eliminate loading, threading and rewinding operations will give tape the convenience of discs. Now used on some special-purpose machines (Pentron, Viking, Mohawk), they will soon be available for home players. Cartridges are self-threading; you just pop them on and push a button.
- Stereophonic sound, an exciting development, will get a big boost from dozens of low-cost players and adapters coming on the market this year. Stereo uses two simultaneous sound tracks recorded from slightly different angles. Played back through separate magnetic heads, amplifiers and loudspeakers, they give you the feeling of space, distance and direction you get from listening to a live performance.
- Tape doesn't wear out. Unlike a grooved disc, it doesn't get scratchy, either. So whether you collect stereo or regular (monaural) sounds, your tapes will be as clean the thousandth time you play them as they are the first.

won't interfere with the picture or sound.

We're selective in our radio and TV pickups. If a recording doesn't satisfy us, we erase it at once. We keep individual spools for Bob's jazz, tunes that Mary and Johnny like, musical comedies, and my wife's favorite operas and symphonies. This prevents hodge-podge concerts, or constant switching of spools.

We use the same system for special tapes. Bob has a small roll for homework. A recitation played back a dozen times before going to bed has a surprising way of planting itself in his memory. My wife has a tape that she leaves on the recorder when she's out and wants a word with us. A red card on the table beside it is a signal for Mary, just home from school, to flip the switch. The box tells her to change to her yellow dress, and what's in the refrigerator for a snack.

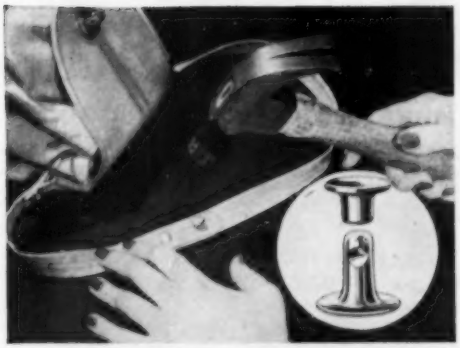
Then there's that family sound album. Since you can't be selective when you're angling for your grandson's lustiest wail, we catch-as-catch-can, snip out the prize excerpts, and splice them together.

Bob and his friend Dick go for more elaborate editing. With two tape recorders and the Les Paul technique, they think nothing of building themselves up into a 12-piece band, imposing one instrument after another on successive recordings. They have also collected a weird assortment of special audio effects, ranging from New York Harbor sounds to a dynamite blast in a stone quarry. They dub these into what they've tried to convince me are educational tapes for school use.

We never inflict tape-box entertainment on friends unless they ask for it. The only exception is the running commentaries we've recorded to go with showings of color slides. Like the minister who wanted to hear what one of his sermons sounded like and fell asleep halfway through the playback, I've learned to trim my recorded travel talk to a minimum—a kindness to both the pictures and our friends.

We're constantly finding new uses for our box. The other day, for example, we sent our first tape-letter to a fellow recordist. That's going to be a big use for these machines, now that they've passed the novelty stage.

Their versatility in dozens of personal and family uses convinces me that tape recorders are a firm part of tomorrow. END



Repairs in a Jiffy

with DOT *SPEEDY RIVETS*

Literally hundreds of uses! Make or mend luggage, footwear, clothing, household utensils! Quick, easy fastening of cloth, leather, plastic, thin metals! A simple swat with a hammer does the trick. Speedy Rivets are available in 2 sizes. Only 15¢ per card. At hardware counters most everywhere. Get yours now!

look for the DOT on the package

COLUMBIA FASTENER CO.
3229 S. Ashland Ave., Chicago 8, Illinois
Subsidiary UNITED-CARR FASTENER Corporation

"THINGS TO MAKE ON TOOLS YOU OWN"

NEW DELTA hard bound book illustrates and clearly describes a wide selection of useful projects designed to be built on each of the basic tools you own — only $1.00. Send for FREE folder on complete Delta Library: Delta Power Tool Div., Rockwell Mfg. Co., 5041 N. Lexington Ave., Pittsburgh 8, Pa.

SAKRETE

Dry-mixed concrete and mortar in a bag. No mess . . . no guess . . . just add water, stir and use. See your building supply dealer, lumber dealer or hardware store — today! ©1957

Look for the Bag with the Yellow Diamond!

NEW 1957 CATALOG **BOAT KITS** 200 MODELS—SAVE 2/3

EASY TO BUILD—Designed for the amateur. Over 200 Models. Prams to Cruisers, 8 to 21 ft. Formed hulls Semi and Custom finished. Save 50%. . . Now NEW Sea Ray Molded FIBERGLAS BOAT KITS. Truly professional results. NO upkeep. SAVE 2/3 assembly time. 12 to 16 ft. Utilities and Runabouts. SEND 35c for 64 page Boat Kit & 24 page Sea Ray Catalogs. SEND $1.00 for both plus "Boating Handbook". Dealers inquire for franchise.

BOAT PLANS & PATTERNS Frame-Pac Kits

World's largest selection: over 200 plans, full-size patterns, frame-pac kits! Designed strictly for amateurs! All types: prams, kayaks, racers, runabouts, catamarans, houseboats, cruisers - inboard-outboard 6-40' wood-plywood-steel: **Send 35c for PLAN CATALOG** Catalog PLUS "Boatbuilding Handbook" $1.00

WRITE NOW! CUSTOM CRAFT, BUFFALO 7, N. Y.

Build Your Own

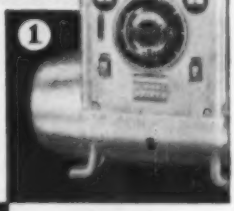
arc welder

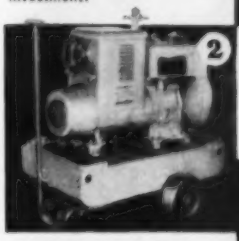
SAVE $200 to $300! GET INTO

big paying jobs

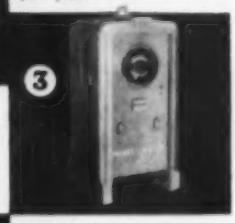
Easy to own...easy to use!

Highly profitable welding jobs can be yours—right away—with a lightweight, portable Build Your Own model. This home-built welder can give you performance comparable to that of a factory-built outfit. No other business offers the profit potential that welding does—for such a low initial investment!

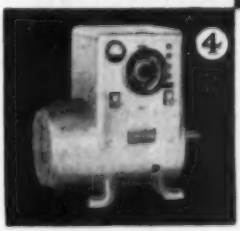




"Husky Boy" 200 amp.
Welds anywhere. Light, rugged, compact, and air cooled. Easily mounts to your trailer for traveling to the profitable emergency repair jobs.



AC Transformer Type
295 amp. AC Welder for operating on single phase 220 volt power. Just right for production and repair work in shops. A welder that quickly pays for itself out of extra earnings.



AC Welder, AC Power
200 amp. combination that you can connect to your own power source. Furnishes current for welding and power for running tools, lights, etc. With the aid of a good used auto engine, you can build your own portable combination welder and power unit. Mail coupon today for full details and free "Build Your Own" booklet. Gets you started in a highly profitable welding business.

Welding Lessons 200 pages fully illustrated, with charts and diagrams. Self-teaching. **$1.00**

HOBART BROTHERS CO., Box P-97, Troy, Ohio
Phone FE 2-1223

HOBART BROTHERS CO., Box P-97, Troy, Ohio
Without obligation, send complete information on:
☐ 1 BUILD YOUR OWN ☐ 3 AC TRANSFORMER
☐ 2 "HUSKY BOY" ☐ 4 AC WELDER, AC POWER
☐ Tell me about the Hobart Non Profit Welding School
☐ Send Welding Lessons Book. I enclose $1.00.

Name_____
Address_____
City_____ State_____

NEW!

SKILSAW

6½" MODEL 536

COMPLETELY NEW SAW
FOR THE HOME CRAFTSMAN

Makes every cut required—even 2" lumber at 45° bevel. New, hi-speed motor—over 1 horsepower. With precision, helical gears. Transmits full motor power to blade for high cutting speed. Model 536 also features the Variable-Torque clutch—an exclusive of SKIL. Protects against motor burn-out, excessive gear-wear. Every new feature means professional SKIL quality in a saw at a home workshop price. Try it at your favorite hardware or building supply. SKIL Model 536 6½" saw—$54.95.

MOST POWERFUL DRILL MADE FOR THE MONEY!

See for yourself! Look at the amperage rating on the nameplate of any ¼" drill. There's where the power is. And SKIL Model 549 beats them all! Only $29.95.

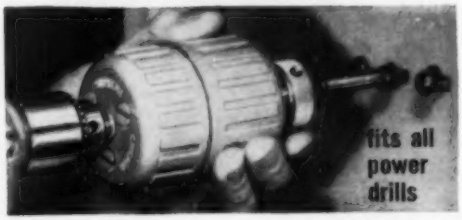
SKIL

Made only by SKIL Corporation, manufacturer of famous SKIL and SKILSAW products, 5033 Elston Avenue, Chicago 30, Illinois. In Canada: 3601 Dundas Street West, Toronto 9, Ontario.

SUPREME

Versamatic

REVERSIBLE SCREW DRIVER AND SPEED REDUCER



First time ever! It REVERSES!

Drive *and remove* screws with Supreme Versamatic. Versamatic reduces speed 7 to 1, increases power 7-fold. *Reverses* with one twist. Handles even the largest screws with ease. Also for nut running (adapter furnished); tapping; and all heavy duty drilling where speed reduction is needed. Fingertip control means safe, fast work. Complete set $14.95. (½" chuck extra). At hardware stores or direct from

SUPREME PRODUCTS Corp., 2222 S. Calumet, Chicago 16

the finest
PUTTY KNIVES
are
Red Devil Tools.

DO MORE PLANING JOBS WITH LOW COST BELSAW

LOW DOWN PAYMENT
EASY TERMS

Exclusive MONEY MAKING Features: Full 12¼" x 6" capacity • Power feeds at 14' to 34' a minute • Provides for Grinding Knives in the Cutterhead • Attachments for Jointing, Rabbeting, Tongue, Matching, Groove. Convert low cost rough lumber into high priced stock. Easy to make flooring and popular patterns. Send Today for FREE Literature and Prices.

Belsaw Machinery Co., 2068 Field Bldg., K.C. 11, Mo.

KING MIDGET

ALL NEW. First model change in six years. New bodies, new chassis, new engine. Four wheel hydraulic brakes. Still World's Lowest Priced Car. Drive it for 75c per week. Rider Agents Wanted. Earn your own car. Get the facts. Send 25c for 32 page picture book with complete details, dealers price, etc.

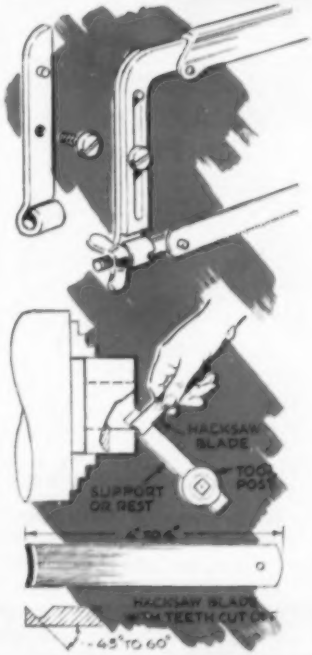
MIDGET MOTORS CORPORATION, Athens 2, Ohio

The POPULAR SCIENCE Shop Notebook

Reading the sizes stamped on drill shanks can tax eyes to the limit. Dab light-colored paint on the shanks and wipe off the excess. Enough paint will stay in the markings (right) to make them easy to read, even in poor light.—*F. A. Javor, Newark, N. J.*

Glued corner joints look better—especially when they're painted—if a little fillet is formed along the inside corner to relieve the sharp angle. After clamping, wipe the squeezed-out glue from the joint with a rag draped over one fingertip. This will clean out the excess glue, yet leave a small amount in the corner. Brush fine sawdust over it and let it dry. The finer particles will cling to the glue line, forming a neat fillet.—*C. C. Cooley, New Buffalo, Mich.*

A hacksaw will cut deeper if its throat is widened by adding an extension to the front of the frame. Cut off the eye that holds the blade tightener and cut a vertical slot in the frame by drilling a series of holes and filing them out. Bend a new eye for the blade tightener in a piece of metal strip and cut it to the same length as the original front leg of the frame. Rivet a guide pin near the top of the strip and tap a hole about midway for a locking screw. Loosen the screw and slide the extension down for maximum cutting depth.—*C. H. Willey, Concord, N. H.*

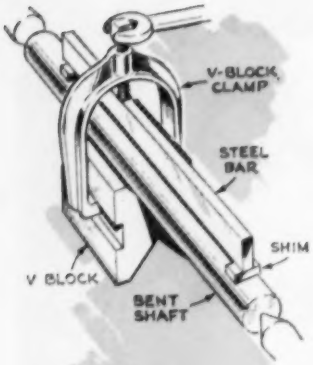


Metals can be turned with hand tools almost as easily as wood. The trick is to grind the tool sharp and support it as close to the work as possible. This radius-turning tool is a good example of a hand tool for metal. To make it, grind a shallow curve across the end of a piece of heavy hacksaw blade, then hold the flat side against a corner of the grinding wheel to grind a back-rake angle behind the curve. Position the lathe's tool-bit holder in front of the work to support the tool. Shave off the metal freehand, checking it frequently with a radius gauge or template. Move the tool support closer to the work as material is removed.—*G. Schlenk, Drexel Hill, Pa.*

Don't discard a broken steel tape. It can be more useful than when it was whole. Short pieces snipped from it in ¼″ to 6″ lengths make it easy to measure in tight spots where longer rules won't fit. A pin vise makes a good holder for the small scales. A 2′ or 3′ length tacked to the edge of your workbench is handy for such common jobs as taking quick measurements, or sizing the width and thickness of stock.—*Phil McCafferty, Cedar Rapids, Iowa.*

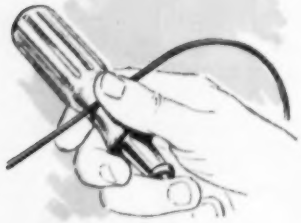
Please turn the page for more shop tips

The POPULAR SCIENCE Shop Notebook



Got a shaft that needs straightening? You can unbend it accurately between the centers of a lathe—even a woodworking lathe—without damaging the machine. Support the shaft between the head and tailstock and rotate it by hand until the hollow side of the bend faces up. Place a small block of hardwood on each end of the shaft and straddle them with a steel bar that's heavier than the shaft. Squeeze the shaft and the bar together with a C clamp or V block; the bar won't flex but the shaft will. Overbend the shaft a bit to compensate for springback. Remove the bar and rotate the shaft against a dial indicator to see if it is true. Repeat the process, if necessary, to completely remove the bend.—*H. J. Gerber, Stillwater, Okla.*

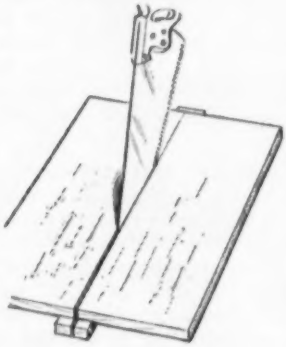
You can lock the jaw adjustment of cam-action pliers simply by adding a lock nut to the adjusting screw. Remove the screw, then twist on a nut of matching thread and screw it back into the handle. After setting the required jaw opening, run the nut up tight against the handle of the pliers to lock the adjusting screw.—*Arthur B. Welch, Syracuse, N. Y.*



Wire that's kinked and bent can be quickly restored to factory-fresh condition. Fasten one end in a vise and pull the wire taut. Then run a hardwood dowel or a plastic screwdriver handle firmly down its length, or, if easier, draw the wire between thumb and screwdriver handle with a motion similar to combing long hair. After a few such passes, the kinks will disappear and the smoothed-out wire will take on a long, uniform curve, making it easy to roll into coils for storage.—*R. J. Cotton, Chicago.*

HAVE YOU TRIED THIS?

To prepare a butt joint for gluing without the convenience of a jointer to produce matching edges, try this: Place the two pieces edge to edge and lightly nail a strip of scrap wood over the joint. Invert the pieces and saw *along the joint line.* The saw kerf will remove material from both meeting edges and any variation on one edge will be compensated for on the other. After the scrap has been removed and the two pieces glued, the joint will be perfectly fitted.—*Rev. C. R. Moase, New Wiltshire, P. E. I., Canada.*



SEPTEMBER IS FIX-UP MONTH
Save Dollars On Home Repairs with

Plastic Steel®

A DEVCON PRODUCT

80% STEEL—
20% PLASTIC

AS EASY TO USE AS MODELING CLAY

A completely new way to make permanent repairs to furniture, toys, tools, models. Fixes leaking pipes, tanks, radiators, cracked engine blocks.

Bonds to metals, wood, porcelain, glass, concrete and other surfaces . . . becomes hard and tough as steel in 2 hours . . . can be machined.

NEW HANDY HOME KIT 98c

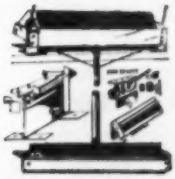
Also $1.89 and $3.95 sizes at leading hardware and hobby stores. WRITE FOR FREE BOOKLET.

DEVCON CORPORATION
180 Endicott Street, Danvers, Mass.

Loosens Rusted Bolts
nuts . . . screws . . . parts

LIQUID WRENCH

The super-penetrating rust solvent that quickly loosens rust and corrosion.
AT HARDWARE STORES, GARAGES, FILLING STATIONS EVERYWHERE
For information write manufacturer
RADIATOR SPECIALTY CO.
Charlotte, N. C.



SHEET METAL BRAKES

Forms angles, locks, pans, etc. Quick eccentric clamp. All steel construction

15"—16 gauge steel	$28.00
36"—22 gauge steel	37.00
48"—24 gauge steel	52.00
32" floor stand	8.00
15"—24 ga. Folder	16.50
36½" Foot-Power Squaring Shear	155.00
36" Pan and box Brake	60.00
¼ x 3 Adjustable Bender	11.50
16 ga. 7" Bench Shear, 3 adj. ga.	16.50
12 ga. Compound Lever Shear	22.00

ORDER DIRECT OR SEND FOR FREE CATALOG

VYKE MFG. CO., N-4158 Jason St., Denver 11, Colo.

TOP VALUES! Surplus at Fraction of Original Government Cost at GROBAN'S

1½ H.P. HYDRAULIC SPEED REDUCER with FINGERTIP CONTROL

Item # 115

USE FOR: • Reamer Drives • Midget Cars • Feed Mills • Canning Machines • Conveyors • Lathes • Milling Machines • Motor Boats • Cream Separators • Garden Tractors • Pumps

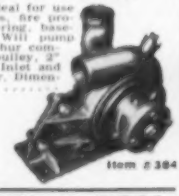
Variable output speeds from 0 to input speed available by moving control handle. Locking handle maintains setting. Use input power of ¼ to 1½ H.P. Shafts ⅝" diam. Input rotation counter-clockwise facing shaft. Input speed 750 R.P.M. 7½"x7½"x11½". Output rotation reversible. Shipg. wt. 31 lbs. Complete with 2 qts. of oil and full instructions. F.O.B. Chicago..... **72.50**

U. S. NAVY ALL BRONZE CENTRIFUGAL PUMP

These all bronze Centrifugal Pumps are ideal for use as marine bilge pumps, circulating pumps, fire protection or irrigation, car-washing, dewatering, basement sump pumping, lawn sprinkling. Will pump water, oil, brine, gasoline, DDT and sulphur compounds. Equipped with 6" adjustable 'V' pulley, 2" dia. Inlet and outlet, 180 GPM capacity. Inlet and outlet take hose with 2¼" inside diameter. Dimensions 11"x8"x11"

Total head-feet	Speed	H.P.	GMP
25	3600 RPS	2	180
32	3000 RPS	1¼	90
20	2400 RPS	.75	75

Back plate may be rotated for most convenient inlet position. Shipping weight 31 lbs. Govt. cost 96.00. F.O.B. Chicago..... **29.50**



Item # 384

BRAND NEW WALKER 5-TON HYDRAULIC LIFT KIT

ITEM #KW-116

FOR — • SNOW PLOWS • TO DUMP FARM WAGONS • ADJUST DEPTH OF PLOWS • HYDRAULIC PRESS • HYDRAULIC JACK. THE COMPLETE KIT CONSISTS OF: 1—Walker Hydraulic Hand Pump—Rated 1500 lbs. per sq. inch with 2 gal. hydraulic reservoir • Release valve • Filler plug and air vent • 28" steel handle. Fine for hydraulic presses; snow plows, jacks. Dimensions: 6" Diameter, 29" long with ⅜" pipe thread port. Pump Assembly Item #P449..... **23.50**

1—6 Ft. length double wire braid rubber covered hydraulic hose—tested to 20,000 lbs. Item #27B4 . **3.95**

1—Hydraulic Cylinder, 3" bore, 6" stroke. Husky ¾" solid steel shaft. Will lift 10,000 lbs. using 1500 lbs. of pump pressure. Clevis mountings that take ¾" diameter pins. May be used for single or double action service. Overall length 17½"—retracted. Item #C419..... **12.50**

1-Gallon hydraulic fluid furnished free with each kit. Plus all necessary hydraulic fittings. Total ship wt.—40 lbs.

COMPLETE KIT PRICE (ALL OF ABOVE INCLUDED) **38.95** F.O.B. CHICAGO

ORDER DIRECT FROM AD—
SATISFACTION GUARANTEED
Send Payment Or Purchase Order Today

FREE—FALL 1957 CATALOG

60 PAGES—Chuckfull of unsurpassed War Surplus and newly manufactured Equipment Bargains for farm, home, factory, workshop. Write letter today.

GROBAN SUPPLY CO. DEPT. PS-9
GROBAN BUILDING
1139 S. WABASH AVE. CHICAGO 5, ILL.

WELD IT YOURSELF IN A JIFFY!

Weld, Cut, Braze, Solder; Iron, Steel, Brass, Bronze, Aluminum and other metals safely and easily. Make your wrought iron furniture, porch railings, fences, knick-knacks and other metal specialties. With this fine equipment anyone can do professional-like work with little practice. The Dynamic is an industrial type transformer arc welder designed to operate from any properly wired 110 volt AC line.

Order your Dynamic Industrial type transformer Arc Welder for Workshop or Industrial use today. Order from this ad.

Literature on larger equipment available on request.

EASY PAY PLAN
Low down-payment. Pay as you weld. Money back guarantee. Complete outfit.
Only $38.50
F.O.B. Factory

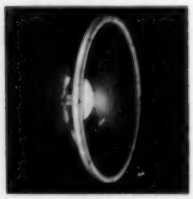
DYNAMIC WELDER COMPANY, 1808 S. Federal Street, Dept. D3-J, Chicago 16, Illinois

inspire yourself

JBL

WITH JBL SIGNATURE PRECISION LOUDSPEAKERS

Build the best high fidelity system ever. Start with precision JBL Signature loudspeaker units. The way they feel . . . the way they look . . . the way they sound will inspire you to lavish the utmost care on the construction of your high fidelity sound system. JBL Signature speakers have a good, solid feel. They look like what they are — precision acoustical instruments. Sound from a properly enclosed JBL Signature speaker is more than high fidelity . . . it is verbatim reproduction. Remember, it takes no more work on your part to build with the best.



Your basic speaker—the JBL Signature D130, the only 15" Extended Range Speaker made with a 4" voice coil. This helps give you crisp, clean bass; smooth, extended highs; unexcelled transient response. With cast frame, highly refined magnetic circuitry, edge-wound aluminum voice coil, the D130 is a true precision transducer.

For improved bass response, you mount your D130 in a properly engineered acoustical enclosure. Either of these two are ideal for your D130 . . .

C37 Bass Reflex Enclosure

C40 Folded Horn

Hear the D130 in these enclosures at your nearby Authorized JBL Signature Audio Specialist. Detailed blueprints for building your own enclosure are available from the factory.

Add a JBL Signature high frequency unit and dividing network to your enclosed D130. Use your D130 as a perfectly balanced low frequency unit. The 075 shown here is made with a machined aluminum, annular, exponentially-tapered horn; big magnet and exclusive ring radiator. It brings you cleaner, more transparent sound, greatly improved definition.

"JBL" means

JAMES B. LANSING SOUND, INC.

3249 casitas avenue, los angeles 39, california

I want more information on the following:

_____D130_____075_____C37_____C40

_____Send free catalog_____and name of nearest JBL Signature Dealer

*name*_____

*address*_____

SAW SHARPENING IS EASY

Super Filer No. 11 joints and sharpens hand and circular saws 6" to 10" with all teeth correct in height depth, pitch, bevel. When file hits hardened steel roller, teeth are finished. Saw runs true with no side pull. Includes 8" file. **$9.95 PPD.**

"TRU-CIRCLE" saw set automatically sets teeth at 10° or more. **$2.95 ppd.**

DOWEL CENTERS Centers inscribe exact location for opposite holes. Pairs for 1/4", 3/8", 1/2" holes. **$1.00 ppd.**

SUPER SAW FILER NO. 6 Automatically controls depth, angle, pitch for all saws. Precision made and calibrated. Use in any vise or clamp. Includes file. **$6.50 ppd.**

MONEY BACK GUARANTEE—CATALOG FREE

A. D. McBURNEY, 5908 Hollywood Blvd., Hollywood 28, Cal., Dept. S-97

PUMP WATER *FAST!*

Drains Wash Tubs, Cellars, Cisterns. Famous #7 pumps 2800 gph 700 gph at 95' high, or 2400 gph from 25' well. Sturdy rustproof alloy metal. Six blade impeller. 3/4" inlet, 1/2" outlet. Standard pipe threaded. Uses any 1/6 to 1/2 H.P. Motor. Will not leak or clog. Ironclad guarantee. Send check, M.O., or sent C.O.D. **$7.95** m.s.l.

Irrigate, Fill Tanks, Draw Well Water. Heavy duty #8 pumps 7000 gph 1200 gph 95' high 5000 gph from 25' well. Rustproof alloy metal. 8 blade impeller. 1" inlet, 1" outlet. Standard pipe threaded. Will not leak or clog. Iron clad guarantee. Send check, M.O., or sent C.O.D. **$11.95** m.s.l.

Free Catalogue—Gear Pumps, Large Centrifugal Pumps, Deep and Shallow Well Pumps, Sump Pumps.

MOORE MANUFACTURING CO.
SWEDESBORO 2, NEW JERSEY

FREE WHOLESALE CATALOG

get up to 50% off

MAKE MONEY!! SAVE MONEY!! Buy Tools, Hardware, appliances, photo equipment, sporting goods, power tools, paints and thousands of other nationally advertised products at WHOLESALE COST TO YOU.

"SEND FOR FREE 1957 WHOLESALE CATALOG TODAY"

SILVO HARDWARE COMPANY
Dept. P59, Box 266, Phila. 5, Pa.

ELECTRIC WELDER AC or DC 110 Volt

The "Little Marvel" all-metal welder 5-year written guarantee. Welds 1/8" metal or money back. Repairs tanks, tools, fenders, machine parts, etc. Complete with everything—rods, unit, eye shield, directions. $7.95 plus 50c postage. Flame torch accessory for soldering, cutting, brazing $3.95 complete with carbons, brass rods, flux. $2.00 deposit on C.O.D. 75 Ampere 1/4 inch Transformer Welder $24.95 F.O.B.

$7.95 Complete

ESSAY MFG. CO., Dept. 47, Quincy 69, Mass.

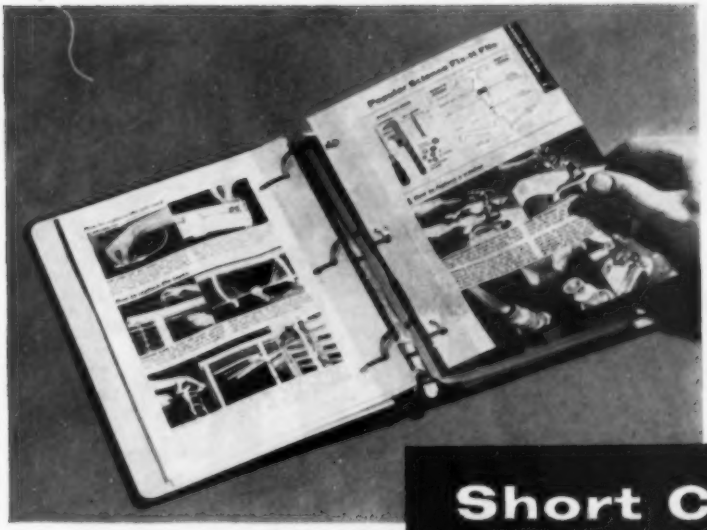
132 PAGES Many in full color packed with rare, fancy & imported woods . . . veneers, plywoods, patterns, tools, ornaments, hardware . . . everything for the woodworker.

Get This NEW Catalog of WOOD & WOODWORKING EQUIPMENT

WORLD'S LARGEST SELECTION OF FINEST DOMESTIC AND IMPORTED WOODS . . . MOULDINGS, HARDWARE, TOOLS,—ALL AT LOW MONEY SAVING PRICES!

Your complete wood buying guide and project book. Craftsman is your best, most complete source of finest kiln-dried domestic and rare imported woods, beautiful wood inlays, colorful bandings, matched plywoods, embossed mouldings, carved ornaments, newest woodworking tools, "hard to find" cabinet hardware and fittings. . . more than 1,500 items! Packed with newest scroll saw patterns, project ideas & money making plans. Enclose 25c (refunded with first order) to help pay mailing, handling cost. Write now!

Craftsman Wood Service Co., Dept. P-5
2729 S. Mary Street • Chicago 8, Ill.



Short Cuts and Tips

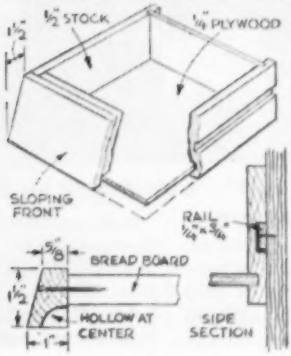
FROM PS READERS

Tape Strengthens Pages of Loose-Leaf Book

I CLIP out the Fix-It File and many other PS articles, and keep them in a loose-leaf book. Since the book gets lots of handling at our house the pages need some reinforcement more rugged than the usual tiny circles stuck on at the ring holes. Because of its extreme toughness, I settled for masking tape.

I sandwich the cut edge of each page between long strips of tape. Half the width of each strip extends beyond the page and I punch the holes in this double-tape thickness.—*R. E. West, Newark, N. J.*

Cabinet with Angled Drawers Needs No Projecting Handles



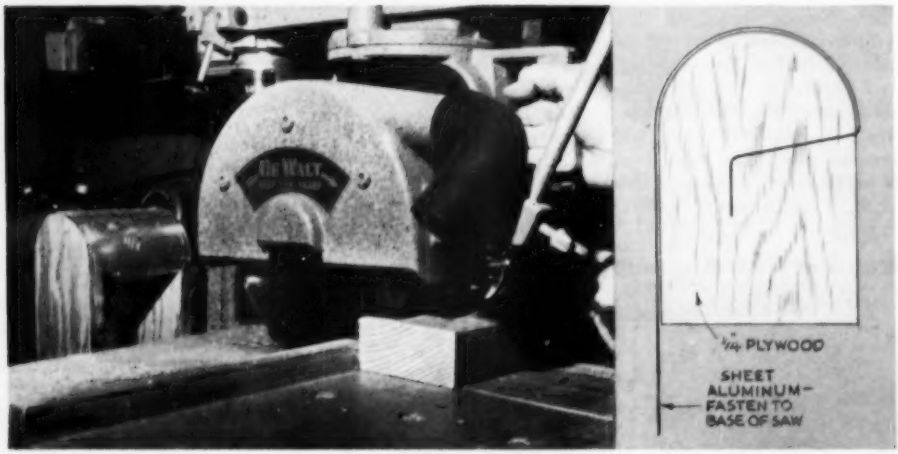
TILTED drawer fronts give this kitchen cabinet a clapboard-like face with no dangling pulls or protruding knobs in sight. Finger grips are hollowed out in the overhang.

The drawers are grooved at the sides to slide over rails, but otherwise internal construction is conventional. A bread board above also has an angled front.—*Hi Sibley, Nuevo, Calif.*

Short Cuts and Tips

Soft-Drink Bottles Make Movable Insulators on Electric Fence

You can cut costs when installing an electric cattle fence if you use pop bottles for insulators. And you get a fence that can be relocated easily, too. Just drive ½″ rods into the ground for posts, up-end a bottle over each one, and loop the electric wire around the necks of the bottles.—*Fred R. Allen, Grand Junction, Colo.*



Trap on Saw Sends Sawdust to Catch-Box on the Shop Floor

A hooded deflector keeps sawdust from messing up my shop as fast as it used to. I cut two side panels from 4″ by 6″ scraps of ¼″ plywood, wrapped a strip of thin sheet aluminum around them and stapled it to the edges. After cutting a mouth opening, I bent the metal flap inward and downward to deflect sawdust to a box under the opening in the base. Some sawdust from the radial saw still escapes, but enough is trapped to make for a big improvement.—*Darrell Huff, Sonoma, Calif.*

amazing scientific development

Gamma
Atomic
Radiation
Detector

PROTECT YOUR FAMILY WITH GARD

An amazing new development in nuclear detection has been utilized to produce an inexpensive emergency radiation detector for use as a home survey meter in the event of a nuclear explosion. Since scientific tests have proved that the intensity of radiation varies greatly within the overall area of fallout, a family may then find the safest spot in their own home by using a detection instrument such as GARD.

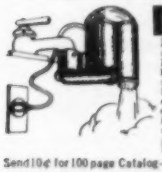
GARD is small and light weight. It has no moving parts that wear, or parts that discharge or need charging, and is made from non-breakable materials. GARD will last indefinitely, and will be instantly ready for use or re-use at any time.

Your family deserves the protection of a radiation detector.

ORDER NOW—ONLY $7.50

15 DAY MONEY BACK TRIAL OFFER. Send $7.50 for your GARD. If you are not completely satisfied, return your GARD and your money will be refunded immediately without question.

Send check or money order to:
Sargent-Rayment Co.
4926 E. 12th St., Oakland 1, Calif.

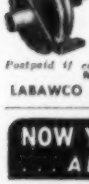


FAUCET WATER HEATER

Instant hot water for just pennies—You just slip MASTER MECHANIC's new Faucet Water Heater over any faucet—plug it in a wall outlet and you've got steaming hot water instantly for dishes, shaving, washing baby's bottle, etc. Simple and safe—operates on ordinary 110 v. house current—costs only 2½ cents per hour for hot water. Ideal for homes, shops, cabins, trailers, etc. Easily regulated from lukewarm to full hot. *Fully guaranteed.* (Item 408) Wt. 2 lbs. **$4.95**
Factory price.....

Send 10¢ for 100 page Catalog-FREE with order. Prices f. o. b. factory—Send check or M. O.

MASTER MECHANIC MFG. CO., Dept. 14-R, Burlington, Wis.



DRAINS cellars, cisterns, wash tubs; **IRRIGATES - CIRCULATES - SPRAYS**

Type P Pump has 1,001 uses. Up to 3,000 GPH; 440 GPH 80' high; or 1800 GPH from 25' well. Use 1/6 to ¾ HP motor. Coupling included free. 1" inlet; ¾" outlet. Stainless shaft. Won't rust or clog! **Heavy Duty Ball-Bearing Pump.** Up to 7,500 GPH. 1¼" inlet; 1" outlet. **$7.95** **$12.95**

Postpaid if cash with order. Also other sizes, types.
MONEY BACK GUARANTEE.

LABAWCO PUMPS, Belle Mead 3, N. J.

Lowest Price **WATER SYSTEM** Completely Automatic! **$49.95** less motor. With 1½ HP motor, **$69.95**
Bronze Gear Pump 275 GPH. 29-40 lbs. ¾" fittings. **Free Circular**

NOW You Can DRILL, SAW, REAM, CUT ... ALL WITH ONE BIT!

Beaver's new improved Hi-Speed side cutting drill bit can be used on any electric drill, drill press, lathe, etc. Made from the finest American hi-speed steel. 3½" long, 2" side cutting section, ¼" diameter. Designed to cut steel, wood, plastic, aluminum, etc. MONEY back guaranteed. Specify types desired. All Purpose, Wood and Heavy Metal. BUY From Your Dealer or send check or money order today.

Dealer & Jobber Inquiries invited. Ideal Gift.

BEAVER DRILL & TOOL CO., 3004 McGee Trafficway, Kansas City, Mo.

Complete Package Unit for

- Home Inside and Outside Painters
- Home Workshoppers
- Do-it-Yourselfers
- Boat Builders and Maintenance
- Farmers — Hobbyists

Yes sir! Only 23 lbs. complete with motor — and still as sturdy and dependable as much heavier compressors.

This Johnson Service Company POWER AIRE is what you want for a "professional" job of paint spraying, inflating, insecticide spraying, etc. It's a little "giant" —

Light weight, compact — 11½" long, 6¾" wide, 10" high — and only 23 lbs. with direct connected 1/3 h.p. G.E. Motor.

Built-in surge tank eliminates pulsation — no storage tank needed.

Forced air internal cooling — runs 20° to 60° cooler.

100% ball bearing and needle roller bearing construction. Piston type, produces oil free air.

Delivers 3½ cfm. of free air and 50 psi pressure.

Guaranteed performance — quality materials, advanced engineering. Simple, oilless, efficient.

Johnson Service Company POWER AIRE comes as a complete package unit—motor and compressor ready to plug in, 15 ft. air hose, and a spray gun that's a pleasure to work with.

Johnson Service Co.
Compressor Division • Milwaukee 1, Wis.

Please send me free literature and the name of my Johnson dealer. (Dealers — write for information and prices on the complete Johnson Compressor line.)

Name.....

Address.....

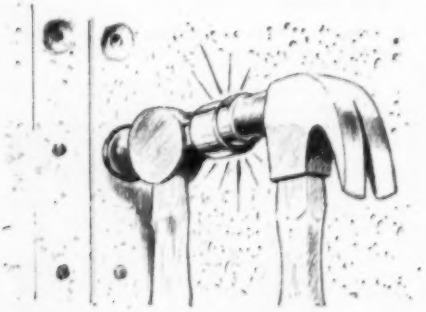
City.....Zone.....State.....

Johnson Service Co. *for 75 years manufacturers of Pneumatic Temperature and Air Conditioning Control Systems.*

Short Cuts and Tips

Wire Locates Electric Cable

MUCH of my work as an electrical contractor is putting in receptacles in side walls on the first floor. I save guesswork and time by making a small hole in the floor below the receptacle and pushing through a fine wire. When I go below, I measure from the wire to the midpoint of the wall, and this shows me where to drill for the electrical cable. After the connection is made, I plug up the floor hole with a match stick. When I have to go to an upper floor to pick up the line, I poke a wire through a small hole in the ceiling. The hole is too tiny to be noticed later.—*I. R. Hicks, Centralia, Mo.*



Two-Hammer Trick Saves Board

I'VE found a sure and simple way of protecting wallboard from a slip of the hammer when I am countersinking the nails used to attach it. I place the ball of a ball-peen hammer against the head of the partly driven nail. Then I hit the flat face of the hammer with another hammer and the nail is set. The little dimple made by the ball of the hammer makes it easier later to fill in the nail holes with plaster. —*G. L. Strobeck, Irwin, Pa.*

Mop-Up Jobs? Keep Paper Near

FOR many jobs—from wiping off an oilstone-honed blade to mopping up paint remover—a piece of newspaper can be the handiest item in a shop. To keep a supply on tap, I pile up old papers an inch thick and cut the pages into quarters with a knife. Then I use an old drill to make a hole and hang the stack of papers on a nail with wire.—*Simon Liebowitz, New York City.*

Beer Can Is Soap Dispenser

WITH a beer can and a marble you can make a handy shop soap dispenser. Cut away the bottom of a can like the one shown, drop the marble in the funnel neck and nail the can to the wall. Fill the can with granulated soap. Push up on the marble to get soap.—*J. A. Comstock, Wellsboro, Pa.*

Do it now with

DAP®

Use DAP Kwik-Seal® for water-tight joints around bathtub, sink, tiling, baseboards. A wonder-white sealer. Long-lasting. Get handy tubes and free do-it-yourself booklet at hardware, paint and building supply dealers.

DICKS-ARMSTRONG-PONTIUS, Inc.
General Offices: Dayton, Ohio

Bore 35 standard holes with just one tool

New IRWIN Expansive Bit

lets you dial your size

Just turn the dial and you're set to go with this new Irwin Expansive bit. No hunting for the size you need. Fits all hand bit braces. Clean, fast, accurate boring action from 7/8" to 3"—35 standard hole sizes in all!

And what a really fine precision tool to own. It's drop-forged from special bit steel, heat treated full length, machined for accuracy and sharpness, highly polished, too. Two cutters supplied with each bit. Model No. 21 with 5/8" to 1 3/4" boring range also available. Ideal for home handyman, professional woodworker, or farm. See your independent hardware dealer soon.

IRWIN
Wilmington, Ohio

the original solid center auger bit
•
screw drivers
screw driver bits

Do a Better Job with DREMEL STRAIGHT-LINE ACTION SANDERS

Send for FREE Power Tool Catalog

DREMEL MFG. CO.
RACINE, WIS.

$14.85 to $34.85

WOODWORKERS!

Brand new 145th Anniversary Edition of Constantine's Manual for Craftsmen—126 pages, many in full color. Complete selection of rare and fancy imported and domestic woods, veneers, inlays, carvings, mouldings, hard-to-get items, hardware, upholstery supplies, plans, patterns and Do-It-Yourself Information. Send 50¢ (refunded on first order) for this big catalog and reference guide.

ALBERT CONSTANTINE & SON, INC.
2054C Eastchester Rd., New York 61, N. Y.

MAKE STRIPES with *new* PAINT PEN

Straight, curved, single or double
With any color paint, stripe furniture, bikes, autos, model planes, toys, linoleum, wallboard. Clean, crisp decorative lines. Can't clog or smear. Also use with glue, tempera, textile paint or underglaze . . . on wood, glass plastic, ceramics, metals, fabrics and paper.
Ask your dealer or order direct

DEALERS — Master paint striping tool in display carton. Write for discounts.

HOBBY — "Professional" results every time. Simple, easy to use. Order now.

MFRS — Ask about heavy duty industrial striping tools.

DOUBLE STRIPE MODEL 5 COMBINATIONS. . . . $3.25

Single 1/16" stripe model $1.25

Other single stripe models $1.75 ea. 1/64", 1/32", 3/64", 5/64", 3/32" & 1/8"

Complete Kit (all 7 tips) $5.00

Extra tips 90c ea.

Extra 1/4" tip..$1.20

WENDELL MFG. CO. 4234 LINCOLN AVE., Dept. 233 CHICAGO 18, ILLINOIS

DraweRacks can be stacked in many ways

PUT stock your Shop IN YOUR SHOP!

EASY TO GET AT!

With ONE HAND you can reach and get . . . *instantly* . . . exactly the size and type of screw you want. "STOCK your SHOP" is a smart, new, convenient, and economical way to buy and store screws. *Try* a few boxes. You'll *like* them!

EASY TO GET OUT!

SCREWS IN NEW CLEAR PLASTIC BOXES

59¢ PER BOX

FOR *EASY* DRIVING, ALL WOOD SCREWS ARE *SPEEDIZED*

An invisible lubricating film on "STOCK your SHOP" Wood Screws makes them *easy* to drive in even the hardest woods! This *free* extra feature eliminates bent and broken screws, prevents sore and aching hands. Ask for *"STOCK your SHOP" the next time you buy screws.*

LOOK FOR THIS SELF-SERVE DISPLAY AT YOUR STORE

ELCO TOOL & SCREW CORP., ROCKFORD, ILL.

This blade won't BUCKLE!

Disston-Carlson
BIG CHIEF. 10'—
$3.25; 12'—$3.50

It's the DISSTON-CARLSON BIG CHIEF

STEEL TAPE RULE

The BIG CHIEF'S wide ¾" white blade stays rigid . . . makes extended overhead and reach-in measurements easy! And just look at all the other features it offers!

- Jet black numerals on a crack-proof, gleaming white surface for at-a-glance reading.
- Double graduations in feet and inches. Stud markings every 16".
- Patented easy action swing tip for accurate inside and butt-end measurements.
- Famous Disston 10-second blade change permits easy replacement without opening case.
- Light, 5½ oz. chrome plated case.

At better hardware and building supply dealers . . . everywhere!

For free folders write: Henry DISSTON DIVISION
H. K. Porter Company, Inc. • PHILADELPHIA 35, PA.

HENRY DISSTON DIVISION
H. K. PORTER COMPANY, INC.

All About Ford's Edsel
[Continued from page 103]

So the rear fenders were lapped over, and the tail-light pattern took on a gull-wing appearance.

A second major decision was that the car had to have an individuality of appearance that would keep it safe from confusion with any other car. At a block and a half, other cars looked alike. All the grille lines were horizontal.

The stylists doodled and doodled to get something different. In the end there was only one answer—a vertical motif. That accounts for the egg-on-end ellipse on the front of the car with an "impact ring"—irreverently referred to by some Edsel per-

An article on how to take care of a '58 Edsel appears on page 242.

sonnel as the "horse collar"— in the center. The nostalgic touch is deliberate. It smacks of the old La Salle or Packard.

"We wanted something familiar," explained a Ford stylist, "so the customers could 'identify with it.' "

The vertical grille design led inevitably to a hump in the hood—a "strong definition instead of a slope-off." Edsel men insist that the hood design provides the motorist with a sense of direction.

The decision to add the Edsel to the Ford Motor stable of cars, at a cost of a quarter of a billion dollars, was strictly self-protective. The company figured it was losing 100,000 customers a year to competitive manufacturers as Ford car owners "upgraded" to costlier vehicles. Chevrolet owners could upgrade to Pontiac, Buick or Olds, and Plymouth owners to Dodge, De Soto or the Chrysler Windsor. Ford owners could upgrade only to Mercury and still stay in the family.

Medium-priced cars, including the top grades of Chevy, Ford and Plymouth, account for 60 per cent of all U. S. sales.

Ford Motor hopes now to keep a lot of that truant cash in its own till.

Implementing the Edsel's introduction is a campaign to establish dealerships selling only the one car for "more stalls in the market place." Norman K. VanDerzee, the sales head, has some 1,400 Edsel-only dealers among a total of 1,500. The others sell other Ford Motor cars, too.

Because plans for any model-year are locked up a full year ahead of a car's ap-

pearance, Edsel is in an unusual position.

"Here we are," remarked one member of the styling staff just before the car's unveiling, "finishing up plans for the 1959 lines of cars, and we're not even on the market yet with the first Edsel."

Now he's busy working on plans for the 1960 Edsel. END

Specifications of the 1958 Edsel

All four lines of cars—the Ranger, Pacer, Corsair and Citation—have the following attributes in common:

Engines: OHV V-8's developing maximum horsepower at 4,600 r. p. m. and torque at 2,800 r. p. m. Compression ratio, 10.5:1.

Rear-axle ratios: With standard transmission (available on Ranger and Pacer only) 3.7:1; with overdrive, 3.89; with automatic transmission, 2.91 or 3.22; station wagons, 3.89 or 3.7.

Steering ratios: 31.8:1; power, with standard transmission or overdrive, 29.7; power, with automatic transmission, 23:1.

Springs: front coil, rear semi-elliptic.

Tread: front 59.4 in., rear 59 in.

RANGER and PACER

(Model: four-door sedan)

Engine: 303 hp.; torque 400 lb./ft.; bore and stroke, 4.05 in. by 3.5 in.; displacement, 361 cu. in.; engine piston travel in feet per minute at 40 m.p.h., 1,310.5.

Transmission: standard, overdrive or torque converter.

Brake-lining area: 191.5 sq. in.

Outside dimensions in inches: height 56.3; overall length with bumpers and guards, 209.9; width 78.7; wheelbase 118.

Inside dimensions in inches: seat-cushion width front and rear 60; leg room front 43.1, rear 40.7; headroom front 33.8, rear 33.5; seat height front 10.7, rear 13.9; vertical distance, steering wheel to seat cushion with seat in mid-position, 5.6.

Tire size: 8.00 by 14.

CORSAIR and CITATION

(Model: four-door hardtop)

Engine: 345 hp.; torque 475 lb./ft.; bore and stroke, 4.2 in. by 3.7 in.; displacement, 410 cu. in.; engine piston travel in feet per minute at 40 m.p.h., 1,342.3.

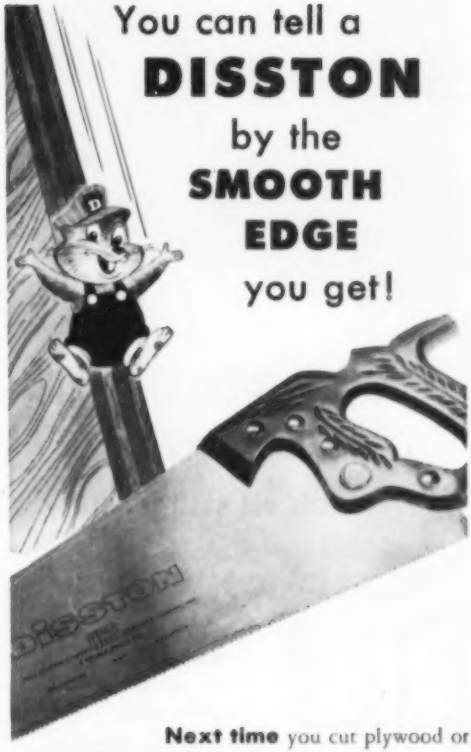
Transmission: torque converter.

Brake-lining area: 212.8 sq. in.

Outside dimensions in inches: height, 56.8; overall length with bumpers and guards, 218.7; width, 79.8; wheelbase, 124.

Inside dimensions in inches: seat-cushion width, front 63.2, rear 63.6; leg room, front 44.2, rear 43.4; headroom, front 33.8, rear 32.7; seat height, front 10.5, rear 14.4; vertical distance, steering wheel to seat cushion with seat in mid-position, 5.2.

Tire size: 8.50 by 14.



Next time you cut plywood or other well-seasoned woods, use a 10-, 11- or 12-point Disston Hand Saw. Note how easily it cuts . . . what a beautifully smooth finished edge it leaves! That's because these fine-toothed saws are specifically designed for finishing work. Made of fine tool steel, with perfectly tempered and double taper ground blade, Disston Saws give years and years of service, too.

At better hardware dealers... everywhere!

Choose a 5½-point Disston Hand Saw for cutting with the grain.

Choose a 7-, 8- or 9-point Disston Hand Saw for cutting across the grain.

FREE ILLUSTRATED BOOKLET! 64-page Disston Saw, Tool & File Manual. Tells how to choose and use tools; how to care for them. Helpful hints on wood and metal working, and selection of materials. For your free copy write today to: *Henry Disston Division, H. K. Porter Company, Inc., Philadelphia 35, Pa.*

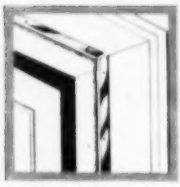
HENRY DISSTON DIVISION

H. K. PORTER COMPANY, INC.

NEW WEATHERSTRIP

has unique pile that

seals out costly drafts



No home insulation job is complete until doors are tightly sealed with DrafTite . . . the new kind of weatherstrip.

Here's weatherstrip built like the kind used to seal out drafts in your car at speeds of 60 miles per hour or better.

Thousands of stiff, tightly packed "piles" enclose millions of dead air cells that cold and wind can't penetrate. Anchored in rubber and attached to rustproof aluminum strips, DrafTite weatherstrip lasts a lifetime.

It can't mat like felt. It won't deteriorate and deform like rubber. It won't buckle and bend like ordinary metal. It never hardens, never gets waterlogged. Once it's fitted, your doors are permanently sealed against the toughest winter weather.

Buy it now from your hardware or building supply dealer. It costs only $1.98 to seal an average door frame and 69c for the door bottom. Installs in minutes. *Trade Mark

The Standard Products Co.
LEXINGTON, KENTUCKY

How Disaster Strikes
[Continued from page 108]

killed 235 children aged up to four and 268 people over 70—but only 37 people aged 20 to 24.

The result, many fire experts think, will be a rise in disasters such as the one in Warrenton, Mo., early this year. In that tragedy, more than 70 people died in a nursing-home blaze. There have been enough such catastrophes recently to start a probe by the Social Security Administration of nursing-home conditions.

How about vehicle catastrophes—air, rail and highway? In the past 15 years, air and auto catastrophes have increased steadily while rail disasters have dropped. "The reason," says a National Safety Council official, "is largely that air and auto travel have grown, while railroads have concentrated all their increase in freight rather than passenger traffic."

From 1941 to 1955, U. S. airlines boosted their traffic from a little over a billion passenger miles to some 23 billion. With more planes flying more people, there were more air disasters. The record shows there were almost three times as many people killed in air catastrophes during the 1951-1955 period as in 1941-1945. This does not mean that air traffic has grown riskier; by the only rational index, deaths per million passenger miles, it has grown steadily safer.

Meanwhile, railroads saw their passenger traffic slide downward, from 29½ billion miles in 1941 to 28½ billion in 1955. This, together with new safety equipment, helped drop the disaster tolls among the nation's railroads.

All indications point to still more expansion of air and highway travel in the decade ahead. So you can expect aircraft and motor vehicles, along with fires and possibly tornadoes, to bulk largest in the next 10 years' disasters.

Can you protect yourself against disasters? Not easily. It's obviously a good idea to check on fire dangers in your home, and to get rid of such wind hazards as dead trees. And to check your insurance policies—you may find that you can't collect if your home is wrecked by waves, overflowing lakes and streams, snow, sand or dust. If you're barred from payments in these cases, you may be able to add low-cost coverage. END

Riding the Turnpike Express
[Continued from page 113]

we were rolling again, I asked him what drivers did about such embarrassments as drunken riders or stowaway pets.

"If a drunk is willing to sleep it off, we let him be," he said. "If he makes trouble we get him off; we'll call the cops if we have to. The only animals we'll take are Seeing Eye dogs escorting a blind person. But sometimes a passenger smuggles through a Chihuahua in a pocket, or a kitten in a carton."

Drivers won't pull up to help a woman change a tire, but they will stop to put out an auto fire or supply first aid.

To become a Hound driver, as they're called among themselves and truckers, you first pass a series of aptitude tests (with enough psychological checks to discover your boiling point in tough traffic or with cranky passengers). Then you go for training in regional driving schools. About one in 10 applicants is taken on.

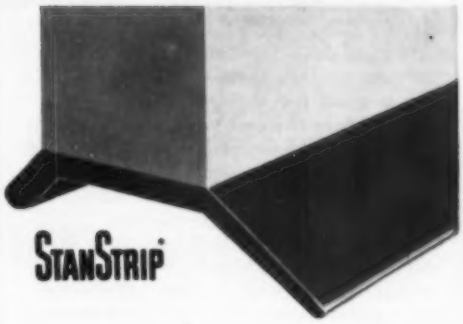
The 156-mile Indiana Toll Road ends near construction work being done on the Calumet Skyway, which will eventually cut down on the stop-and-go driving we had from that point.

Eventually, Chicago: After handling some tight turns on Wacker Drive, Moore swung into the tunnel ramp leading to Greyhound's big underground loading concourse. Electric-eye signals held him briefly; then he got the dispatcher's light, rolled around to the dock it assigned him, and pulled in with a gentle sighing of air brakes. Time 10:55.

We had come 860 miles in 16 hours and 40 minutes actual running time, at an average speed of 50.7 m.p.h. We'd been set down in the heart of Chicago's Loop, in a swank modern terminal close to hotels, transportation, stores and theaters. Our luggage arrived with us (150 pounds rides free on a ticket). We'd saved money; round-trip fares between Chicago and New York, including tax, are about $40 by bus, $63 by rail coach, $73 by air coach.

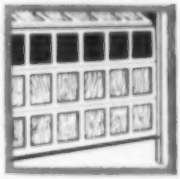
There was one catch. As we said goodbyes to those going to California, Calgary, Oregon and other far-flung places, I had to duck the perfectly natural question they all asked in return.

How the heck could I tell them Bill and I were taking a bus right back to New York? END



NEW KIND OF SEAL

Protects garage doors . . . seals out rain, snow, drafts



StanStrip doubles the life of garage doors by cushioning the shock of closing. At the same time, it permanently seals the door bottom against rain, snow, dirt and drafts.

And you can install it in only a few minutes.

StanStrip is molded from a special synthetic rubber developed expressly for this kind of service.

It's tough . . . to withstand abrasion and impact. It stays soft and flexible in the coldest weather. It never sets or deforms. It follows the raggedest floor contours to make the tightest possible seal.

You've invested a lot of money in your overhead garage doors and you'll want to protect that investment.

You can protect an eight-foot door for only $2.95 with StanStrip. A sixteen-foot strip costs only $5.90. Your hardware or building supply dealer has StanStrip now. Install it this week end. *Trade Mark

The Standard Products Co.
LEXINGTON, KENTUCKY

[Continued from page 117]

companies take the broad view that *any* studying an employee does on his own time is good for the company.

When does the company pay? Some refund the tuition immediately upon registration; others wait until the grades are in. Many of the latter will lend the tuition until time to settle up.

Who is eligible? Most programs cover both salaried and hourly workers. Some say any employee is eligible; others specify he must have a year or so of service. But that doesn't mean that everybody who wants in gets in. For college courses and many skilled-craftsmen courses, a high-school diploma is essential. And aptitude tests preselect the most promising candidates for very generous programs.

Besides the companies I've mentioned, here are 17 other blue-chip firms with tuition-aid plans: Eastman Kodak, American Cyanamid, B. F. Goodrich, Western Electric, Armstrong, American Cord and Webbing, American Viscose, Celanese Corp., Brown and Williamson Tobacco Corp., General Dynamics, American Gas and Electric, Food Fair Stores, Bigelow-Sanford, M. W. Kellogg, Standard-Vacuum Oil, Home Life Insurance, Metropolitan Life Insurance.

3 Alternate college and work periods

This is the "co-op" plan for earning a college degree in five years—a college student shares a full-time job with a classmate. They alternate on the job and in the classroom. The money earned in the work phase is usually more than enough to carry all expenses.

Last month in the article "You *Can* Afford to Send Your Child to College," PS mentioned several colleges cooperating in this program. Here our concern is with the cooperating companies, and there are more than 600! They include such firms as DuPont, General Dynamics, Armco Steel, Allis-Chalmers, Armstrong, Chrysler, and International Nickel. RCA reports it has 96 "co-op" students working at plants in Camden, N. J.; Cincinnati, Ohio; Harrison, N. J.; Lancaster, Pa.; Moorestown, N. J.; Somerville, N. J.; and Waltham, Mass.

Perhaps the most unusual cooperation scheme is that of General Motors, which operates its own "co-op" college, the General Motors Institute, at Flint, Mich. Students—about 2,500 of them—divide their time between instruction at the institute and carefully planned work assignments in GM factories or dealerships. They change from study to work and back to study every month or two.

Technically all student "appointees" must be sponsored by a division of GM. However, if your son is not now working for GM and is interested, he can apply by writing to the Registrar, General Motors Institute, Flint, Mich. A sponsorship will be arranged if he qualifies.

4 Go away to school at the company's expense

You will find that many companies now are setting up scholarship programs for employees (or their children).

The Food Fair Stores Foundation offers personnel of that supermarket chain 78 scholarships a year. They typically are renewed annually and have a value over the four college years of $1,000 to $4,000. Among other companies that reserve scholarships for employees (or employees' children): Standard Oil of New Jersey, American Steel & Wire, Chicago Tribune, General Electric, Goodall-Sanford, Hotel Statler, Monsanto Chemical, Norfolk & Western R.R., N. Y. Airbrake, U.S. Steel.

Owens-Illinois scholarships (more than a dozen) are open to others besides its employees, and it offers, in addition, to guarantee the winners summer jobs. Minimum pay: $600 per season.

The Johns-Manville Corp. has a unique program of aid which it calls "Company Offers" rather than scholarships. If it would like an employee to undertake a particular course of study to make him more valuable to the company, it will send him to college at full company expense—and at full pay.

Free education for your youngster needn't stop with college, either. Many firms have fellowship programs, for employees going after advanced degrees, which are far more generous than the companies' undergraduate scholarships.

Many an employee who starts off well at free education may find his employer paying him to keep-going. END

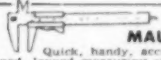
WAR SURPLUS AND OTHER BARGAINS SAVE UP TO 90%

BUTANE BLOW TORCH KIT. A must for any well equipped tool chest. Precision soldering, brazing or metal craft. Starts charcoal fires, too. Tiny, clean, safe charge, 3500° pinpoint flame; turns on & off. Featherweight, 7" long complete, kit incl. torch, solder, tip, extra fuel cartridge—**$2.95 ppd.**
BLOW TORCH ALONE—$1.95 ppd.

140-1 REDUCTION GEAR Make your own winches, hoists, wagon unloaders, stump pullers or fence stretcher. Sturdy aircraft quality. Built-in (removable) 24 Volt DC motor & clutch. High torque. Low speed. 100's of uses. Wt. 42 lbs. Approx. GOVT. COST $300. Like NEW. **$12.00**
*225-1 Reduction Gear, same as above — **$13.50.**

FAMOUS B-16 KOLLSMAN AIRCRAFT COMPASS Finest compass ever made. In current use on large and small planes. Ideal for boats, cars, trucks, etc. Graduated in 5° increments. Liquid filled, lighted, poly-plane compensator. Panel mounting 3⅛" dia. face, 4½" in depth. Checked & re-tested in our own lab. Approx. GOVT. COST $150. Like NEW. **$12.95** ppd.

HEAVY-DUTY RHEOSTAT Designed for heavy-duty use with Air Force heated suits. Ideal for regulating voltage on electric welders, model trains, lights, generators; controls soldering irons, etc. Rated 5.75 ohms, 100 watts with double windings and dual female 25 amp. 125 volt receptacles. Size: 7" H x 5¼" W x 1¾" D, Shpg. Wt. 2½ lbs. Approx. GOVT. COST $25. Brand new, only **$1.95.**



NEW IMPROVED MAUSER-TYPE VERNIER CALIPERS
Quick, handy, accurate. 6" Vernier Calipers. Glass hardened, lapped measuring surfaces. Fine engraved scales—1/1000" and 1/128mm for inside, outside & depth measurements. Friction thumb release. Larger capacity. 2 gib adjustments. Reg. $25. Now only **$7.95.** Leather case **$1** extra.

BENDIX PUMP & MOTOR
Can be used for pumping fuel, oil or wherever hydraulic pressure is required. Pump has 1" connections, built-in relief valve, adjustable up to 1500 lbs. Max. capacity 6 GPM. 1½ H.P., 24 volt motor, 4000 RPM. Can be used on 12 to 36 volts. Approx. GOVT. COST $350. NEW — **$10.95.**

ASTRO COMPASS MARK II A standard instrument used by U. S. Air Force & Navy & commercial airline navigators for obtaining true heading, checking & adjusting magnetic compasses, taking bearings of celestial & terrestrial objects & identifying stars. Makes a satisfactory pelorus & azimuth circle for either air or marine navigators. Perfect for amateur astronomers. Complete with carrying case. Approx. GOVT. COST $400. NEW **$12.95** ppd.

DUPONT EXPLOSIVE RIVETS! A must for the man who works with sheet metal. A hot soldering iron placed on the head of the rivet will explode and mushroom the other end of the rivet self-bucking itself. 1/8" - 5/32" - 3/16". Round and flat heads. Approx. GOVT. COST $50.00 & 1,000. NEW. 1,000 assorted, **$5.00** ppd.

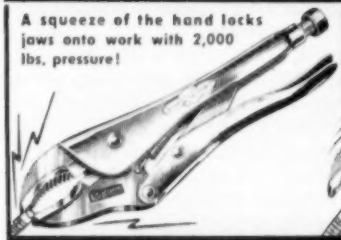
MICROMETERS Black crackle finish frame. Easy-to-read graduations in .001. NEW. 0-1" cap. **$2.69** ppd. 1-2" cap. **$3.79** ppd.

JUST OUT! 1958 CATALOG. BIGGEST YET! FANTABULOUS!
Thousands of bargains in war surplus and other items. Hundreds of pictures. A must for the value minded! Send 25c for your cost today!

Postpaid prices in USA only. Other prices FOB Culver City, Calif. Send check, cash or money order. 50% deposit required for COD orders.

AIRBORNE SALES CO., INC. DEPT. PS957
8501 Stellar Drive, Culver City, Calif.

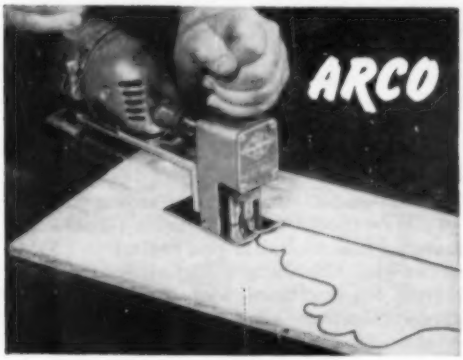
VISE-GRIP Now This Easy to Open!

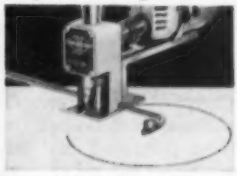


EASY DOES IT with the **new** Vise-Grip! Squeeze, and jaws lock **tight**... press Easy Release and jaws click apart. Really a whole tool kit by itself! Quickly adjusts to any size work — for use as a Locking Wrench, Super-Pliers, Hand Vise, Clamp, and Wire Cutter. Get the new Vise-Grip and **feel the power it gives you.** 7" and 10" models, wire cutter optional, only $2.15 to $2.95.

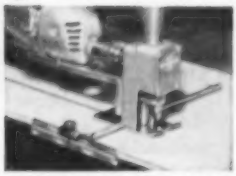
AT YOUR HARDWARE STORE • MADE ONLY BY PETERSEN MFG. CO., Dept. P-9, DeWitt, Nebr.

"ARCO JIG-SAW" cuts any shape, any material!





Cuts Perfect Circles with Exclusive Circle-Cutter



Makes Straight & Parallel Cuts with Exclusive Rip-Gage.

"Arco Jig-Saw", guaranteed to fit every ¼" drill, cuts any pattern in woods, plastics, metals—even cuts **2x4's!** Has same capacity and outperforms the most expensive saws because of **ARCO'S exclusive adjustable Circle-Cutter** (up to 20" diam.) and **Rip Gage.** Cuts its own starting hole. "Air-Jet" blows away sawdust. With blade **$10.95**

6 Extra Assorted **Blades** for wood, plastics, metals $1.95

At Your Dealer or order direct on our **Unconditional 10-day Money Back Guarantee.** Send check, M.O. (ppd) C.O.D. plus post.

ARROW METAL PRODUCTS CO.
Dept. PS-9, 421 West 203 St., New York 34, N. Y.

Toughest Rescue in Mining History

[Continued from page 127]

mines since he was 16. Tiedemann selected the team to work with him, choosing the strongest, ablest and most courageous of the miners.

Spiess and Effenberger, sitting in the darkness, knew nothing of the rescue work going on within a few hundred feet of them. Cold was no problem, the temperature of their area being close to 80 degrees Fahrenheit. But their limbs were beginning to stiffen. To keep them limber they took occasional exercise, stumbling up and down the dark pit. By now, they were beginning to get slightly faint from hunger. Water helped ease pangs from empty stomachs.

Spiess, a deeply religious man, prayed a good deal. Effenberger recalls: "I always had big ideas about being a success and about making money. Somehow, these things no longer seemed important. The important thing was to be alive."

They both worried a great deal about their wives and children. How would they get along if . . . Effenberger's wife and son were in the Russian zone of Germany, near Leipzig. Plans had been laid to get them out, and into free Germany by Christmas. What would happen to them if the Christmas reunion didn't take place?

Below them that fourth day at Level 8, the drill was biting into the rock. But its progress seemed torturously slow—seven feet an hour when everything went right. As a precautionary measure, Mieles decided to start a second boring. A borrowed drill was set up a short distance down the tunnel from the first.

By the fifth day, Spiess and Effenberger could hear the faint grinding sound of the approaching drill, guessed what it meant. From time to time it would stop while workmen below screwed on another length of shaft. There were moments of terror. Had the drill broken down? Was the rescue effort being abandoned? Trying desperately to signal, they pounded on mine rails with iron bars. Then the most wonderful of all sounds—the faint grinding—would begin again, all the time getting nearer.

At three a.m. of the sixth day there was a crunching sound on the floor of the dank prison. Effenberger switched on a light. There was the slowly rotating head of the drill. The two men grabbed bars and started pounding furiously. The crew of rescuers heard them. They had gotten through. Then began the long job of pulling the drill shaft out, uncoupling sections one at a time.

Banking on success of the drilling, Mieles had made advance preparations. He had ordered the mine machine shop to make a slender, four-foot-long aluminum "bomb." Packed with food, this would be pushed up through the hole to the trapped men. A company doctor had drawn up an appropriate menu for semi-starved men: porridge, zwieback, milk, dextrose, tea, chocolate. Other things were packed in the bomb: lamp batteries, pencils, paper, a ball of string—to be used to draw up a telephone wire. A miner's lamp was fastened atop the bomb, its beam pointing upward, so the trapped men could see its approach.

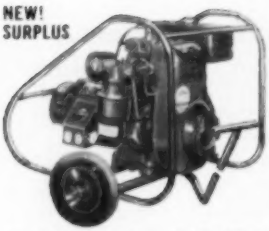
For hours Effenberger and Spiess hovered around the top of the drill hole. Then, peering down, they could see the faint light approaching. "Here comes salvation," said Effenberger.

By December 3, Tiedemann and his crew had the old shaft retimbered so it was safe. They were now ready to begin work on the rescue shaft. Starting above the cave-in area, and proceeding in a slanting direction so as to avoid as much of the loose, shifting rubble as possible, it had to traverse a distance of 40 feet. To prevent further cave-in, the new shaft was boxed with heavy timbering as it progressed downward.

Since the shaft was small—46 by 50 inches—there was usually room for only one man at a time at the advancing face. Big stones were broken up with drills, Fragments were loaded in iron buckets, and the buckets passed upward to men clinging precariously to timbering. As many as 14 men at a time crowded into the small hole. At moments of greatest pressure, the exertion required of the man at the face was such that even the strongest could last no more than 20 minutes. Relief took over while he had a rest period.

Spiess and Effenberger had eaten the food from the first bomb with the full expectancy that from now on there would be a steady supply. Then Bomb No. 2

NEW! SURPLUS



WISCONSIN 4-CYCLE Gas Engine Driven GENERATING PLANT

2500 WATT, 60 Cycle, 115 Volt, Single Phase

Only $299.50 fob

GOV'T. COST $500.00

FULL 1-YEAR GUARANTEE

Wheel Base Assembly With Tow Bar...$17.95 extra

PORTABLE!—fits easily in car trunk! Protective carrying frame incl.

PAYS FOR ITSELF! Saves time, labor and money. Provides on-the-spot power for CONSTRUCTION, etc., where none is available or expensive to run in. Large enough for Floodlights; Saws; Pumps; and many more labor-saving heavy-duty machines. Ideal as a stand-by emergency power plant to duplicate house current. Plenty of power for lights, refrigerator, deep freeze, oil burner, radio, etc. Specifications below. CAN'T BE MATCHED anywhere at this price!

Remote Control Governor increases engine life by allowing engine to run at idle speed when load is removed from Generator.

GENERATOR 2500 Watts, 115 Volts 17.3 Amps., 60 Cycle, single phase. Overload capacity well above its rated output. Excellent **automatic** voltage regulation plus Field Rheostat for even closer adjustment. Built-in Voltmeter and receptacles.

ENGINE Famous WISCONSIN 6.8 H.P. air cooled engine, 4-cycle. Weather proof high tension magneto with impulse coupling for quick easy starting in any weather. Mechanical Flyball governor. Adjustable carburetor with automatic choke release. Timken roller bearings — self cleaning.

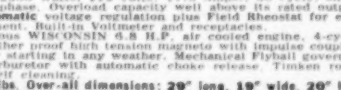
Weighs 155 lbs. Over-all dimensions: 29" long, 19" wide, 20" high

SUPPLY LIMITED! IMMEDIATE DELIVERY! ORDER FROM AD

FREE WAR SURPLUS — WHOLESALE CATALOG

ROBERTS ELECTRIC CO. Dept. PS-681. Phone TAYLOR 9-1365 849 W. Grand Ave., Chicago 22, Ill.

MECHANICAL PENCIL CALCULATOR *NEW INVENTION*



MATH-WIZ pencil calculator gives answers automatically to addition, multiplication and square root problems. (Indirect subtraction and division.) Easy to operate, comes in gold anodized **aluminum casing**. Useful gift for students, engineers, draftsmen and in all industry. Only **$2.25** postpaid. No C.O.D.

Not a Slide Rule

JACK WEISER, 1233 S. Fairfax Ave., Dept. S, **Los Angeles 19, Calif.**

---

3 CU. FT. MIXER DIRECT FROM MFR. 39.75

Fills long felt need for small mixer for concrete, feed, fertilizer, seed and many other materials. Saves ¼ cost of ready mixed concrete. Pays for itself on first job.

3 Cu. Ft. Drum—Mixes 2 Cu. Ft. Concrete $39.75
5 Cu. Ft. Drum—Mixes 3 Cu. Ft. Concrete 59.50

FOB Pulaski, N. Y. Cash, Check or M. O. Money back guarantee

UNITED STATES FORGE AND FOUNDRY CO.
CONSTRUCTION EQUIPMENT DIV. PULASKI, NEW YORK

SAVE 60% ON SAW BLADE COST

WITH HEINEMANN'S **HARD-TIP** SAWS

Deep hardened for easy resharpening. So economical, stays sharp so long it's practical to replace blade when dull to save resharpening cost. See your nearest dealer, or request brochure from . . .

HEINEMANN SAW CORP.
CANTON, OHIO

GENUINE ALNICO MAGNETS

AMAZING, PERMANENT, NON-ELECTRIC, HIGHLY PRACTICAL. Conducts interesting experiments. Hundreds of uses. Retrieve valuable steel items such as guns, tackle from fresh or salt water; tools from tanks & drains. **GUARANTEED.** Try any magnet one week. Money back if you are not well-pleased.

No. S-710 (Wt. 53 oz.) Has pull of 225 lbs. on steel block $16.50
No. S-625 (Wt. 70 oz.) Has pull of 125 lbs. on steel block $ 9.50
No. S-575 (Wt. 18 oz.) Has pull of 75 lbs. on steel block $ 6.50
No. S-500 (Wt. 13 oz.) Has pull of 50 lbs. on steel block $ 4.50
No. S-300 Kit of Flat Bars 5 Pairs (10 Magnets) ..... $ 3.00
No. S-250 Kit of Round Rods 5 Pairs (10 Magnets) ..... $ 2.50
No. S-47 Hot Pad Magnets. 10 for $1.00 ..... 60 for $ 4.87
No. S-38 Hobbyist assortment of 8 small magnets ..... $ 1.80

Send M.O. or check. We pay postage. Sorry no C.O.D.'s.

MIAMI MAGNET COMPANY, 3240 N. W. 27th Ave., Miami 42, Fla.

See the amazing new EASY-TO-BUILD ELECTRONIC knight-kits in ALLIED'S 1958 ELECTRONIC SUPPLY CATALOG

FREE!

BUILD YOUR OWN! SAVE MONEY—HAVE FUN

HI-FI KITS
HOBBY KITS
INSTRUMENT KITS
HAM KITS

404 value-packed pages

SAVE on Everything in Electronics

WORLD'S LARGEST STOCKS

Everything for Experimenters, Builders, Amateurs, Servicemen, Engineers and Hi-Fi Hobbyists. Get more for your money in Hi-Fi systems and components; build-your-own KNIGHT-KITS; recorders and phono equipment; TV tubes, antennas, accessories; Amateur station equipment, test instruments; industrial electronic equipment—plus the world's largest stocks of parts, tubes, transistors, tools and books. Send today for your FREE 1958 ALLIED Catalog!

Everything in Electronics From One Reliable Source

our 37th year EASY TERMS AVAILABLE

ALLIED RADIO send for FREE Catalog

ALLIED RADIO CORP., Dept. 27-J7
100 N Western Ave., Chicago 80, Ill.

☐ Rush FREE 1958 ALLIED 404-Page Catalog

Name _____

Address _____

City _____ *Zone* ____ *State* ____

Schupack's Amazing Tool Bargains! Save up to 100%!

75 Mounted Wheels & Miniature Cutters. Regular $11.00 value $4.50 Postpaid

For cutting and grinding on wood, metal or plastic. Includes 26 mtd. wheels and points on 3/32" shank; 24 miniature cutters on 3/32" shank; 25 short shank min. cutters. Will fit all electric drills and hand grinders.

FLEXIBLE SHAFT—ONLY $6.50 Postpaid

Fits all electric drills & hand power tools. 55¾" long. Oilite bearings. Core of specially wound, high carbon steel wire in flexible steel casing. Will accommodate tool shafts up to ½" dia. For lathes, electric drills, etc.

2 DRUM SANDERS

With 12 Bands in Assorted Grits. ½" dia., 3 1" long on ⅛" arbor with 12 bands ..... $1.50 Postpaid. One drum, 1" dia. x 1" long on ¼" arbor with 6 extra sleeves $1.00 Postpaid

8 Carbon Steel Wood Bits for Brace. Assorted sizes, 3/32" to ⅝", for drilling on wood or metal ..... $1.75 P.P.

15 Assorted Drills. From 1/16" to ½" high speed steel and carbon. Only..... $3.95 P.P.

30 Assorted Drills. Hi-speed steel & carbon. Up to ½" dia ..... $2.75 P.P.

12 Assorted Drills. High speed and carbon steel from ⅛" to ½" ..... $3.60 P.P.

12 MINIATURE CUTTERS

For cutting wood, plastic or metal. Assorted shapes on 3/32" shank ..... $1 P.P.

12 MOUNTED WHEELS and points on ⅛" Shank. $2.95 36 for $87.50 p.p.

For grinding on plastic, wood, soft & hard metals. Regular Value $8.40. **18 Mounted points on 3/32" shank $2.50; 12 mtd. wheels on ¼" shank $3.60.**

ADAPTER CHUCK

With 2 interchangeable collets, opening from 3/32" to 6, on ⅛" mandrel. Price each only $1.50 p.p. **Adapter Chuck, From 60 to 80 on 3/32 in. Mandrel $1.00**

7 H.S. and carbon drills from 6" to 12" in length. Assorted sizes up to ½" diam. for drilling in hard to reach places. A reg. $10.00 val. for only..... $1.95 P.P.

7 Larger Drills. From ½" to 1-1/64". High speed steel and carbon..... $7.50 P.P.

5 Woodworkers Drills. From ¼" to ⅝" on ¼" shanks..... $2.95 P.P.

2 Circular saws. On 2 Mandrels—all at one low price. 1" diameter saws on ⅛" Mandrels. For cutting wood, plastic or soft metals..... $1.50 P.P.

32 H.S. steel drills, threaded shanks from 3/32" to ¼". Reg. $9.50 value, only..... $2.00 P.P.

18 Rotary Cutters P.P. $5.95

Assorted sizes cutter on ⅛" or 3/32" shank. Will fit all hand grinders. Ideal for cutting wood, metal, or plastic. Brand new.

No C.O.D.'s Catalog 10c.

SCHUPACK SUPPLY CO. 731 COTTAGE GROVE AVE. DEPT. S-60 CHICAGO 19, ILL.

REDI-BOLT®
THREADED STEEL RODS

Save repair and construction time. Just cut to length; heat and bend; add std. nuts. Seven sizes: ¼", 5/16", ⅜", 7/16", ½", ⅝", and ¾". Handy lengths of 24" and 36". Available in galvanized or blue rust-resistant finish.

Sold in Leading Hardware Stores

REDI-BOLT, Inc.

5344 Indianapolis Blvd., East Chicago, Indiana

Toughest Rescue in Mining History

jammed in the shaft, probably against loose rock. It had to be drilled out—a 24-hour job. Hunger and despair returned to the trapped miners.

With communications re-established and food transport up and down the drill hole working smoothly, life became more tolerable. Soap was sent up for baths in the iron tubs. Letters to wives came down—also a message: "How about a steak?"

Working under conditions almost fantastically difficult, Tiedemann inched his shaft toward the trap area. On the eighth day it broke into the entry. "You are all right now," called Tiedemann. Word was flashed to the surface. Ruth Spiess bought a bunch of flowers for her husband. Rescue seemed minutes away. Then the earth gave another convulsive shake.

There was another deep rumble. The rescue shaft was well timbered and had survived. But the previously open space at the bottom of the shaft was now closed by tons of loose rock. The trap had been sprung again.

On a round-the-clock basis, the new cave-in was attacked. On December 8 at five p.m. the final break-through was made. Rescue was at hand—the longest, most difficult rescue in modern mining history, and probably, at $30,000, the most costly.

Tiedemann, rightly idolized by the men who work for him, crawled through the opening. Not knowing what emotional state the trapped men might be in, and not wanting anything to go wrong at this moment, he sat down and started chatting matter-of-factly.

He told how the rescue had been effected. It had been quite a job. The biggest job he'd ever undertaken. Yes, the letter Effenberger had written his wife had been mailed. He could start for their reunion in a couple of days, after a routine hospital check-up.

As he talked, Tiedemann watched the two men—whose faces were covered with stubbly beards. Finally, he was convinced that they were strong enough to clamber up the timbering in the rescue shaft, and climb in the big steel bucket for the ride up to Level 7.

Casually he rose, stretched. "Come on boys," he said. "Time to go. This shift has lasted long enough." END

Amateur 'Moon Watchers' Get Set

[*Continued from page 137*]

field of his telescope. "Out," "In," and "Out of the field," he may call as he does so. (At stations that dispense with signal buttons, and use the observer's voice directly for timing, short prearranged words like "Time!" or "Mark!" would have to be used.)

All this may happen fast—in less time than it takes to tell it. At its nearest 200-mile approach to observers, the satellite will be going as fast as 1.3 degrees a second, and so will be visible for less than 10 seconds in a watcher's 'scope.

At a satellite finder's jubilant shout, do his fellow-observers drop their tasks and join in a look? Nothing of the sort! With spartan discipline, they must keep right on with their own watching, resisting any temptation to desert their posts. It's possible that the supposed sighting was a false one, perhaps mistaking a plane's lights for the satellite—and the real one might come past another watcher a moment later.

The one who does share a look at the satellite is the team's leader, for it's his duty to make sure there's no mistake about it. He'll follow it with a telescope or binocular of his own. So that he can swing his instrument into the satellite's path in a hurry, it may need a quick-adjusting mounting of special design; that's the problem they've been working on most recently at Silver Spring.

The scene of action shifts, once a satellite sighting's verified. The team goes indoors, for a playback of the tape recording. Starting from an identified even minute, the leader and several observers count the seconds of the time signals, up to each "beep" of the electric button. When all agree on the count, the leader jots down each time, upon a rough pencil sketch of the satellite's path across the observer's field of view.

Since each watcher's view of the sky is limited to about 12 degrees, the declination or altitude of the satellite's meridian crossing is roughly fixed simply by which observer saw it. This observer should be able to refine the figure's accuracy to within one degree, by estimating how high or low in his field the satellite crossed the mast.

Notes in hand, Wright as team leader will then pick up his telephone and

NEW! DISCOVERY!

SAVES PLUMBING BILLS

CLEANS INSTANTLY

CHICAGO—Sept. 1st—Home Owners, Offices, Apartments, including Factories are constantly having trouble with clogged-up pipes which proves expensive in Costly Plumbing Bills—

But now—using Water Impact and Air Pressure, here is a new unit called the **Plumber's Flushing Gun**, which cleans all lines up to 100 ft. It will open any number of bends in pipe. Yet anyone can operate this new gun, which triggers easily.

TOILETS, URINALS, SINKS, and FLOOR DRAINS clogged with paper, grease, rags, sand, and other debris can be cleared with one or more shots from the gun, **saving the owner, the Gun's price the first time it is used.** This new Flushing Gun may be used on any ½ to 6 inch waste pipe including Sink Drains, Floor Drains, Hot Water Pipes, Drinking Fountains, Septic Tanks, and Urinals. Obstructions melt away INSTANTLY when struck by the hammer like blow of this new unit.

AMAZINGLY EFFECTIVE a hose attachment from the faucet (not shown here) leads water thru the Gun and pipe while at the same time air is released causing a Powerful Chain reaction.

This New Flushing Gun is offered on 30 Days Free Trial. BUT MOST IMPORTANT IS THIS—What is this Tool worth in **Costly Plumbing Bills** Saved in your Home or building? For your own good—Tear this Ad out now and write your name and address beside Ad for **FREE BOOKLET.** No agent will call—Obey that urge, mail now or write postcard. (Chicago Phone Kildare 5-1702) **MILLER SEWER TOOLS, DEPT. PS-9, 4642 N. CENTRAL AVE., CHICAGO 30, ILLINOIS.**

A miracle in a can!

Amazing, easy way to remove paint

The latest and fastest way to strip paint or any other finish! Just apply Wonder Remover. Let it work a few minutes. Then wash off with water. Surface is ready to refinish immediately.

Wonder clings to uprights, and can be used indoors or out. Non-flammable and safe for hands.

At paint and hardware stores.

Backed by 50 years' experience in making paint removers

● ***Send 25¢ for illustrated Manual on Refinishing***

or write for free Wonder Remover leaflet

Wilson-Imperial Co., 121 Chestnut St., Newark 5, N. J.

WONDER

water wash off *Paint Remover*

call Moonwatch headquarters, the Visual Tracking Center set up by the Smithsonian Astrophysical Observatory at Cambridge, Mass. Having identified himself and his station, he'll read off the data of the satellite sighting.

An electronic brain takes over now. At the Center, Wright's figures will promptly be fed into a huge computing machine, together with the latitude and longitude of his Silver Spring station. These last figures are already on file at the Center for all registered Moonwatch stations, which are the only sources from which amateurs' reports of sightings will be accepted for use.

From leaders of other Moonwatch stations, similar telephoned reports will be coming in at the Center, and will likewise be fed into the electronic brain. Chewing on the first scattered few received, the computer will tentatively calculate the satellite's orbit and predict its future path. As it digests later reports, it will revise its calculations, and foretell the course of the "moon" more and more accurately.

The amateurs will have professional rivals. Scientists are setting up a worldwide net of radio receiving stations to track a satellite, by the signals its Minitrack radio transmitter will continuously emit during the batteries' life of about three weeks. The Minitrack observing net will chart the "moon's" orbit with an electronic computer of its own.

Lastly, giant Schmidt cameras will have been set up at strategic points over the globe to track the satellite with the greatest precision of all. Their photos will be essential to the important scientific studies that depend upon observing the satellite's motion. But these ultra-powerful telescopic cameras have so limited a field of view, only three degrees wide, that they'll be unable to find the satellite themselves. They'll have to be directed to it, by either the Moonwatch or the Minitrack network. So will astronomical observatories' great telescopes.

Now, if all goes according to plan, the scientists' Minitrack network will be able to locate a newly launched satellite promptly—and to tell the Schmidt stations where to point their big cameras.

Where do the amateurs come in, then? Initially their role will be to backstop the scientists. Suppose a satellite's radio doesn't work—unlikely, but possible enough to give the Minitrackers bad dreams. Then the tiny globe could be lost in the sky and never found again. Not only would that particular launching go for naught; if it happened to be the only successful one of the whole series, all the effort and expense of the $50,000,000 satellite project would have been in vain. Unless, that is, devoted amateurs at toy-sized telescopes could locate the silent satellite and save the day. If a "moon" is lost, the amateurs' Moonwatch stations will go on an emergency schedule of continuous evening and morning watches until it's found.

The leading role will go to the amateurs, in any case, before the end of a satellite's career. Eventually its orbit will wobble unpredictably, as it loses altitude and spirals downward into the earth's atmosphere. Then the Schmidt cameras will lose it. Its radio will long since have gone dead. Only the amateurs will be able to keep on following the "moon" during the last and especially interesting period of its existence. That is the time when its motion, by revealing the unknown density of the rarefied air up there, will tell what scientists and future spacemen need to know about the very fringe of the atmosphere.

In between, during the major part of a satellite's life—which may range up to a year or more, if it can be placed accurately enough in its intended orbit—Moonwatch teams will keep in practice observing it. Taking many factors including weather into account, observers at a typical Moonwatch station should be able to see the satellite something like once a week on the average (though actually at more uneven intervals), either during evening or early-morning twilight hours. For as long as a satellite follows a known and predictable path, those will be the times when the Moonwatch teams will assemble and go into action.

History will be made by amateurs of Moonwatch. Says Dr. J. Allen Hynek, in charge of the optical Satellite Tracking Program: "We believe that these teams may well be recognized in the future as pioneers in the greatest scientific research project ever participated in by non-professional observers." END

Sharpen ALL CIRCULAR SAWS THE QUICK-WAY*

*patented

Model PG-12 Complete No extras to buy. $19.95 Postage Paid

Sharpens, joints, gums and retooths all cross-cut, rip, standard and master combinations, miter, planer and radial saw blades to 12" diameter. Precision sharpening guaranteed by special Index Dials. New safety guide prevents tilting or gouging. Mounting block and special $3.00 grinding wheel furnished. Fits bench, table and radial swing saws. Thousands of satisfied users. Featured in leading publications. Order today. Send check, cash or money order. We pay postage in U.S.A. Free Booklet "How to Sharpen Circular Saws."

QUICK-WAY SAW CO.
134 Tompkins Street Cortland, N.Y.

RETAIL PRICE $125.00

FACTORY TO YOU $79.95

SUPERSHOP includes precision-built 8" tilting table saw, vertical and horizontal drill press, 30" lathe, sander, grinder. 100% BALL BEARING. Write for FREE catalog, full details, trial plan.

POWER TOOLS, INC.

299 YATES AVE.
BELOIT, WISC.

MAKE A WATER LEVEL

FOR LAYING OUT FOUNDATIONS, FLOORS, DRAINS, ETC.

Reservoir feature gives you 100 ft. of leveling with only 50 ft. tube, and precise one-man operation. Clear tough vinyl tube, specially designed, .300" o.d. kinkproof, 50 ft. $4.95; 75 ft. $6.95, check or M.O. ppd. C.O.D. postage added. Includes vial of color and complete instructions for making and using reservoir type level. Refund guaranteed.

HYDROLEVEL • 929 DeSoto Avenue, Ocean Springs, Miss.

EXPLORE FOR TREASURE!

Find gold, silver, coins, jewelry, battle relics! Treasure—Metal—Mineral Detectors. M-SCOPE. Used worldwide for Treasure Hunting, Mineralights, Geiger, Scintillation Counters. Prices from $14.75. Fully GUARANTEED. Time Payment Plan. FREE Treasure and Uranium booklets. New outfitting catalog. FISHER RESEARCH LAB., INC., Dept. PS-1, Palo Alto, Calif.

CLEARANCE!

$1 RIFLE SALE $1

Hunters! Shooters! We have mixed surplus stock of 25M well-used European military rifles from World War II conflagrations. $12 to $15 value. While they last we will send you one of these serviceable rifles for $1 extra with purchase of each Lee Enfield Rifle or .45 Colt Automatic. This offer good for 30 days only!

LEE ENFIELDS $24.95

FOR DEER HUNTERS

The firepower and accuracy of a $100 rifle. Brass and outside Four Fund .30 cal. FREE ammo. Powerful .303 Cal. ammo available everywhere. OUR AMMO SPECIALS: 100 rds. target, $1.50, 20 rds. inflame hunting, $2.95.

FOR TARGET, RANGE SHOOTING

.45 U.S. ARMY COLT AUTO.

The official sidearm of the U.S. Army. A $74.50 value. These are rare surplus item these days. OUR AMMO SPECIAL: 50 rds. $5.00.

TO ORDER HAND GUNS ONLY! Enclose signed statement "Am not alien, never convicted of crime of violence, am not under indictment or fugitive, am 21 or over." Mass., Mo., Mich., N.Y., N.J., N.C., R.I., Omaha, New Orleans, require permits—enclose with order. TO ORDER send check, cash or M.O. Send ½ deposit on C.O.D.'s. Don't forget, add $1 for extra rifle. Shipped R.R. exp. F.O.B. Los Angeles collect. Calif. resid. refer thru local dealers only. 10-day money-back guarantee.

$39.95 MECH. PERFECT

THE ELLNER COMPANY DEPT 27

1206 MAPLE AVENUE, LOS ANGELES 15, CALIFORNIA

MAD FOR LADS who use AERO SHAVE!

Save 20¢ a Can!

So, go man! Get rich, creamy AERO SHAVE . . . the smoothest, slickest lather bomb of all! Three beard softeners *plus* gentle Lanolin! *Feel—save* the difference! Only 59¢.

59¢ AERO SHAVE

Buy U.S. Savings Bonds

WHAT DO YOU KNOW ABOUT HAND SAWS?

HIGH CROWN

. . . means that the tooth line is curved or arched. This arched tooth arrangement gets fewer teeth engaged in the wood at a time . . . reducing friction, making cutting easier . . . faster. SANDVIK Swedish Charcoal Steel Hand Saws feature this high crown. This is only one of SANDVIK'S many exclusive advantages. Before you buy any hand saw, ask your dealer to show you a SANDVIK.

Want to know more? Write today for the new 16 page booklet that tells all. "*Things You Should Know About Hand Saws.*" It's free! Dept. P5

Sandvik SAW & TOOL

Division of Sandvik Steel, Inc.
1706 NEVINS ROAD, FAIRLAWN, N. J.
IN CANADA: P.O. Drawer 1330, Station "O," Montreal 9

[*Continued from page 141*]

refineries are blown up in war, it can run on crude oil; we have fed it everything from 100-octane gasoline to shale oil."

GM's next move, says Underwood, is to put a free-piston locomotive on the rails. The engine will be a "siamesed unit"—two gasifiers will pipe gas to a common turbine geared to the drive wheels, delivering 1,500 to 2,000 hp. This locomotive, which will be running by the end of the year, is not the first of the new motors to drive an iron horse. Since 1952 a free-piston locomotive built by Renault, the French auto maker, has piled up more than 60,000 miles hauling a 240-ton train daily between Paris and Cambrai. A single gasifier drives the turbine, delivering about 1,000 hp. to the wheels through reduction gears. Operation has been simple and trouble-free. Efficiency reportedly matches that of the diesel, burning the cheapest residual fuel oil. "No other locomotive," states *The Engineer's Digest*, "approaches the successful compromise between first cost, maintenance and fuel cost, as demonstrated by the French experiment."

While several inventors were early workers on the free-piston principle, chief credit is given to Marquis Pateras Pescara of Spain, a helicopter pioneer who built an engine in 1923, thinking it might drive an ungainly whirlybird he had made. It didn't. But the novel engine attracted wide attention. Junkers of Germany built free-piston air compressors without the turbines. These were used on German U-boats during World War II. Marquis Pescara sold his patents 20 years ago to a Swiss engineering group. Its two associated French firms, SIGMA and SEME, are now leading manufacturers. Last year about 80 free-piston engines were in operation in Europe for marine and stationary power. Associated British Engineering Ltd. has contracted to build the world's largest free-piston plant, of 36,000-kw. capacity, as a part of the Singapore public-utility system.

Like the diesel, the free piston has first proved itself in big installations of the "draft-horse" class. While it took diesel breeders about 35 years to produce a "mule" (trucks, tractors, buses), there is every indication that the new engine will reach this status much earlier. Already committed to commercial production for ships and locomotives, General Motors will next develop heavy-duty automotive engines. International Harvester's research department is also working on an engine, and regards it as attractive from the standpoints of performance, economy, simplicity and operator-comfort.

Ford is setting no sales date for its tractor, but Dearborn top brass recently asked its free-piston engineers what they would say if given unlimited funds and orders for full steam ahead. They replied that they would rather work on the engine for a while.

"We have two goals for further development," said Klotsch. "We should be able to run the pistons at twice their present speed and double the power output. Of course that involves a lot of engineering. And we should develop automatic controls for the bounce pressure [the compressed-air 'springs' that force the pistons back together when they reach the end of their outward strokes] and for the maximum effective working stroke of the pistons. Today the pistons do about what they want to do; we want them to follow definite orders. They will become less 'free' but more efficient."

There is little doubt that under a crash program a line of free-piston-powered heavy-duty vehicles *could* appear in the salesrooms in three years. But engineering is only one factor in such a decision, and the date of debut is still cloudy.

The free-piston passenger car—the "race horse" of the line—will come last on anyone's schedule. Dr. Donald H. Frey, associate director of the Ford Scientific Laboratory, believes that any new motor that supplants today's gasoline engine must weigh less, occupy less space, cost less, operate more economically and give better vehicle performance, and that not a single one of these factors can be ignored.

That is a tall order, but men like Paul Klotsch are confident that it can be filled. They know they are shooting at moving targets, for far more money and talent are being spent on improving the straight gas turbine and the gasoline engine. If such men prevail, we may have a superior, cheaper car engine that will convert fuel oil into mileage now unheard of. END

115 V. 60 CYCLE AC SURPLUS COMPRESSOR BARGAIN

These were used by the Navy to keep gunnery instruments dry and free of salt water & corrosion. Motor & compressor are a single unit. Compressor normally delivers up to 15 PSI. Can be converted to deliver up 35 PSI. Motor operates on normal house current of 115V., 60 cycle AC & is rated 1/10 HP. Turns 1725 RPM. Comes with 0–15 PSI gauge.

UNCONVERTED, without filters 21.95
CONVERTED to 35 PSI, without filters. 24.95
Equipped with Special Filters for use as moisture-free air supply, inflating, spraying, etc. 27.95

AIR STORAGE TANK – Ideal for use with above compressor. Has 280 cu. in. cap. Size 6"x 14-1/2". Tested to 400 PSI. 1/4" ports. 2.95

3400 RPM ½ HP POWER SAW

RIPS - CROSSCUTS

CUTS A FINISHED 2x4 LIKE A KNIFE THROUGH BUTTER

COMPARES TO SAWS SELLING UP TO $49.50 — 19.98 Complete with 5-1/2" Blade

A rugged, professional type, adjustable saw. Will cut any angle from 0 to 45°. Has an adjustable (0 to 6") rip fence. Safety-trigger switch on handle. Full ½ HP Universal AC-DC, 110-120 Volt, 60 cycle motor. Weighs only 6½ lbs.

EXTRA SAW BLADES – Available in Rip, Crosscut or Combination. Please Specify — ONLY 2.25 EA

SAVE 50%

PHILIPPINE MAHOGANY LUAN PLYWOOD

For Paneling Dens, Offices, etc. Use in Cabinets, Furniture, etc. Rotary cut. Both sides sanded. Bonded with finest resin adhesive. Face side unjointed. Shipped at lowest rates.

FREE SAMPLE ON REQUEST

3mm (1/8") x 3FT. x 6 FT. $5.00 VALUE — 1.79 PER SHEET — MINIMUM ORDER 6 SHEETS

1/4" x 4FT. x 8FT. 9.50 VAL. — 4.49 PER SHEET — MIN. ORDER 4 SHEETS

TRANSLUCENT FIBERGLAS PANELS

Finest quality. Available in many widths and lengths. An excellent color selection in present stocks. Ideal for use in the home or office. FREE SAMPLE and instruction booklet on request.

85c Val. for 49¢ SQ. FT.

NEW! DECORATIVE! HEAVY WROUGHT IRON TRELLIS

FOR PATIO ROOF SUPPORTS–DIVIDERS, etc.

Use them INDOORS or OUTDOORS! Heavy 1-1/8", black tubular iron supports with a beautiful wrought iron filigree between them. 8 ft. high (can be cut to 7 ft.), 12" wide. In either flat or corner type. Mounting flanges included.

FLAT TYPE 9.95 EA. — CORNER TYPE 17.95 EA.

SAVE 50%

DECORATE with this "LUAU" NET KIT

Transform your den, lanai, playroom or patio with this exotic South Sea island decor. The 4' x 9' net contains 2 cork floats, star fish, sea fan, glass float, tiger cowry & pink murex. Ideal for home, night club, etc. 4.95

COMPLETE 1" ALUMINUM SPRINKLER SYSTEM KIT

NO DIGGING! NO BURYING! LASTS FOREVER! EASY TO STORE

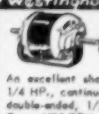
Just lay it on top of the ground. Assemble and disassemble without tools. Features Nationally Known RAINBIRD SPRINKLERS. Attaches to your present hose connection. Compact – Lightweight (just 20 pounds). Provides irrigation for 2000 square feet. Everything complete in the kit including simple instructions. Open stock always available. Write for fully illustrated folder today 59.95

1/6 HP. 115 V. AC MOTOR

Only 7.95

Another Palley Bargain Buy! MOTOR, HANGER MOUNT and DUAL V-BELT pulley included. An ideal shop motor. Operates on 115V., 60 cycle, 1-phase and draws 3.8 amps. Turns 1725 RPM. Pulley is 2" dia., and takes 1/2" & 1/4" V-belts. Hurry – stock limited.

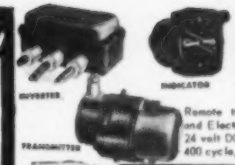
DBL. SHAFT 1/4 HP Westinghouse MOTOR



Only 14.95

An excellent shop or utility motor. 1/4 HP., continuous duty type with double-ended, 1/2" diameter shaft. Turns 1725 RPM and operates on 115 volt, 60 cycle current. Rubber mounted on sturdy steel base.

LARGEST FIRM OF ITS TYPE IN THE WORLD



SPECIAL MARINE TYPE REMOTE READING MAGNESYN COMPASS SYSTEM

Ideal for navigation of small to medium size boats. Complete system includes Remote transmitter, Remote Compass Indicator and Electric Inverter. Can be operated from 12 or 24 volt DC input. Inverter gives 26 volt, 400 cycle, 1 phase output required. 39.95

B-16 FLOATING CARD COMPASS

Ideal for small boats, autos, aircraft, etc. Full floating card, liquid dampened. Has internal compensating magnets. 3" diameter face with lighted dial. Rear panel mounting. Super Palley Bargain ..... ONLY 9.75
SAME type as above but with external compensating magnets and caging device 14.95

U.S.A.F. MAGNETIC COMPASS

Standard navigational equipment on Army Aircraft. Rotating verge range ring. Calibrated in 1° increments 0 to 360°. Two parallel grid wires for N-S alignment. Rubber lined. Ideal for private planes, boats, etc. 17.50

AUTOMATIC PILOT SERVO UNIT

ADAPTS TO AUTOMATIC BOAT STEERING TV or BEAM ANTENNA ROTORS AUTOMATIC DOOR OPENER REMOTE MACHINERY CONTROL

Ideal for reversible motion applications. Has a 1/20 HP, 24 VDC, 2270 RPM continuous duty motor. A 133 to 1 gear reduction train gives 17 RPM take-off speed. Twin, plate clutches are solenoid operated. A special galvanometer reads percent of rotation. Free wiring diagram. 19.95

COST GOV'T APPROX. $500.00

NEW NYLON AIR CORPS LIFE VEST

Nylon cover with pure gum rubber inner liner. Inflated by CO_2 cartridge or by mouth. Has adjustable waist-strap harness & 2 pockets. NEW 8.95

NEW ARMY CANTEEN & REISSUE CUP AND BELT

A one quart canteen and aluminum cup fit into the insulated canvas cover. Choice of web type pistol belt or cartridge belt with pockets. The canteen is new Korean War Surplus. 2.29

PALLEY BARGAINS "DIVING EQUIPMENT"

PALLEY DIVING LUNG KIT

BUILD YOUR OWN! – SAVE up to $100. Our special folder has complete instructions showing how its done. Kit includes Air Bottles, Pressure Regulator, Safety Belt, Air Hoses, Mouthpiece, Clamps, Valves, Shoulder Harness, etc. Everything needed. Price of this Kit with 2 Air Bottles (1 hour time) $150 Value. 45.95

SEE CATALOG below for our complete stock of Diving Equip. Includes Fins, Tanks, Goggles, Guns, Lungs, etc. in both New and Surplus types. .....

HYDRAULIC REMOTE CONTROL MASTER & SLAVE

When connected with ¼" tubing and filled with oil they act as a precision remote power transmission unit. Moving Master handle causes Slave arm to respond in exact motion from 0 to 90°. Ideal for remote machinery controls, etc. Available in New and Used condition.

No. H-EX-1SU Both units used $27.50
No. H-EX-1NSU Both Units NEW $42.50

FINEST STEEL BAYONET

Genuine infantryman's bayonet. Made of the very finest tool steel. Fluted sides and precision honed edge. Blade is 8" long making it an ideal knife for skin diving use or as a hunting knife. Comes complete with a reinforced leather scabbard. 2.89

NEW NAVY KNIFE

KNIFE 2.98 HOLSTER 1.50

Dagger design with laminated leather handle. Blade is 6-1/2" long, hollow ground on the cutting edge – double edged for 3-1/2" at the point. Ideal for skinning or hunting knife. Comes in a genuine leather belt holster. Overall length 11".

WORLD'S MOST AMAZING BARGAIN CATALOG

NEW! JUST OFF PRESS

1957 EDITION - 396 PAGES

NATIONALLY ADVERTISED MERCHANDISE • NEW and USED GOV'T. SURPLUS • FACTORY CLOSEOUTS • EXCITING IMPORTS!

From EVERYWHERE PALLEY'S now bring you items of every description! This fabulous catalog contains Hand & Power Tools, Microscopes, Binoculars, Industrial and Building Materials, Housewares, Office Equipment, Sport & Outdoor Equipment, Cameras, Photo Supplies, Hobby Kits & "Gadgets", Electrical & Radio Supplies, Meters & Generators and a HUGE selection of Surplus Hydraulic Cylinders, Pumps, Valves, etc.

We are now one of the foremost manufacturers of CUSTOM-MADE HYDRAULIC CYLINDERS. Our tremendous volume enables us to sell for BELOW MASS PRODUCTION PRICES!

Send 50¢ (for handling & mailing) – LIMITED EDITION! ORDER YOURS NOW! 50c REFUND on your first order of $1.00 or more.

ORDER-BY-MAIL TERMS: Send Check, Cash or Money Order. 25% Deposit with C.O.D.s. Prices F.O.B. Los Angeles, Calif. Warehouse.

Palley's 7263 EAST VERNON AVE., DEPT PSV, LOS ANGELES 58 CALIF.

SOUTH BEND

Light Ten Precision Lathes are ideal for the machining of small precision parts. They are accurate, smooth, fast and easy to operate which results in exceptional efficiency on all operations. This productiveness, combined with low initial cost, gives you more actual value for your money. Write for complete information—there are possibly many places you can profitably use these precision lathes.

SPECIFICATIONS

Swing over bed—10". *Distances between centers*—16" to 34". *Collet capacity*—$\frac{5}{8}$". *Spindle bore*—$\frac{27}{32}$". *Spindle speeds:* twelve—48 to 1435 r.p.m. approx., sixteen—52 to 1365 r.p.m. approx. Available in bench, metal column base and floor models with power and manual feeds and change gears or quick change gear box. Also, toolroom models. Prices start at $369 f.o.b. factory.

More Value for Your Money

RECENT PURCHASERS

Allegheny Ludlum Steel Corp.
Federal Reserve Bank of New York
State University of New York
Rayco Tool & Die Co.
South Carolina Electric & Gas Co.
General Electric Co.
United Shoe Machinery Corporation
Eder Instrument Co.
Atomics International
Borger Gas Engine Co.
Prospect Tool & Manufacturing Co.
Northern Michigan College
Signode Steel Strapping Co.
Borough of Queens Sewer Maint.
Lindell Electric Control Corp.
Empire State Laboratories
United Nations (Receiving Area)
Sandia Corporation
Reynolds Metals Company
United Service
Bridgeport Jig Boring Co.

Send for this Helpful Book

Every lathe operator needs this information-packed handbook, How to Run a Lathe. Written in a clear, easy-to-understand style. 128 pages, 360 illustrations. 50c postpaid.

SOUTH BEND LATHE

SOUTH BEND 22, INDIANA

Builders of Lathes, Milling Machines, Shapers, Drill Presses, Pedestal Grinders

Are You Giving Your Wife The Companionship She Seeks?

YOU may be giving your family all the love and care you are able to. You may have given your wife a good home, security, many of the conveniences all women yearn for . . . but are you giving her the full companionship which she expected out of marriage? Are you sharing common interests with her? Or are you always "too tired" to see friends, to go out for an occasional evening of fun and relaxation? Are you really giving your family and wife the time and energy which they expect?

Or do you come home from work with only the "left-overs" of your vitality for your family? Is time catching up with you too fast . . . at work, at play?

If so, your condition may simply be due to a common vitamin and mineral deficiency in your diet. Yes, you may be well-fed, but poorly nourished. The food you eat may just not contain the necessary amounts of vitamins and minerals to keep you healthy and vigorous. You owe it to yourself to find out whether a food supplement such as VITASAFE capsules can restore the youthful feeling you'd like to have. And you can find out at absolutely no cost by taking advantage of this sensational free offer!

FREE 30 DAYS SUPPLY OF HIGH POTENCY CAPSULES

25 Proven Ingredients—LIPOTROPIC FACTORS: Choline, Inositol, and Methionine—11 Vitamins (including Blood-Building B-12 and Folic Acid), 11 Minerals

To prove to you the remarkable advantages of the Vitasafe Plan . . . we will send you, without charge, a 30-day free supply of high-potency VITASAFE C. F. CAPSULES so you can discover for yourself how much healthier, happier and peppier you may feel after a few days' trial. Just one of these capsules each day supplies your body with over *twice* the minimum adult daily requirement of Vitamins A, C and D—*five times* the minimum adult daily requirement of Vitamin B-1 and the *full* concentration recommended by the National Research Council for the other four important vitamins! Each capsule contains the amazing Vitamin B-12, one of the most remarkably potent nutrients science has yet discovered—a vitamin that actually helps strengthen your blood and nourish your body organs.

EACH DAILY C. F. CAPSULE CONTAINS:

Choline Bitartrate	31.4 mg.	Vitamin B2	2.5 mg.	Iron	30 mg.
Inositol	15 mg.	Vitamin B6	0.5 mg.	Cobalt	0.04 mg.
dl-Methionine	10 mg.	Vitamin B12	1 mcg.	Copper	0.45 mg.
Vitamin A	12,500 USP Units	Niacin Amide	40 mg.	Manganese	0.5 mg.
Vitamin D	1,000 USP Units	Calcium Pantothenate	4 mg.	Molybdenum	0.1 mg.
Vitamin C	75 mg.	Vitamin E	2 I.U.	Iodine	0.075 mg.
Vitamin B1	5 mg.	Folic Acid	0.5 mg.	Potassium	2 mg.
		Calcium	75 mg.	Zinc	0.5 mg.
		Phosphorus	58 mg.	Magnesium	3 mg.

COMPARE THIS FORMULA WITH ANY OTHER!

POTENCY AND PURITY GUARANTEED

There is no mystery to vitamin potency. As you probably know, the U. S. Government strictly controls each vitamin manufacturer and requires the exact quantity of each vitamin and mineral to be clearly stated on the label. This means that the purity of each ingredient, and the sanitary conditions of manufacture are carefully controlled for your protection! And it means that when you use VITASAFE C. F. CAPSULES you can be *sure* you're getting exactly what the label states . . . and that you're getting *pure* ingredients whose beneficial effects have been proven time and time again!

AMAZING NEW PLAN SLASHES VITAMIN PRICES ALMOST IN HALF!

With your free vitamins you will also receive complete details regarding the benefits of an amazing new plan that provides you regularly with all the vitamins and minerals you will need. BUT YOU DO NOT HAVE TO DECIDE NOW—you are under no obligation to buy anything from us whatsoever. If after taking your free Capsules for three weeks you are not entirely satisfied, simply return the handy postcard that comes with your free supply and that will end the matter. Otherwise it's up to us—you don't have to do a thing—and we will see that you get your monthly supplies of vitamins *on time* for as long as you wish, at the low money-saving price of only $2.78 per month (*a saving of almost 50%*). To get your free 30-day supply and learn all about the benefits of this amazing new Plan, be sure to send the postcard now!

DETACH HERE AND MAIL TODAY—NO POSTAGE NEEDED

VITASAFE CORP., Dept. 275-7

43 West 61st Street, New York 23, N. Y.

Please send me free a 30-day supply of the proven VITASAFE CF (Comprehensive Formula) Capsules, under your money-saving plan. I am not under any obligation to buy additional vitamins, and after trying my free sample supply, I may accept the monthly benefits and substantial savings offered by the VITASAFE Plan, or if not fully satisfied will reject them simply by returning the postcard provided with my free supply. In any case, the trial month's supply of 30 VITASAFE Capsules is mine to use free.

Name _____

Address _____

City _____ Zone _____ State _____

This offer is limited to those who have never before taken advantage of this generous trial. Only one trial supply per family.

DETACH HERE

© 1957

VITASAFE CORP., 43 West 61st St., New York 23, N. Y.

Is Time Catching Up With You Too Fast?

MAIL POSTCARD

for FREE

30-DAY SUPPLY OF VITAMINS TODAY!

No Postage Stamp Necessary If Mailed in the United States

BUSINESS REPLY CARD
First Class Permit No. 10083—New York, N. Y.

VITASAFE CORPORATION

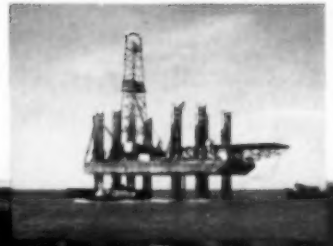
Dept. 275-7 43 West 61st St.,
New York 23, N. Y.

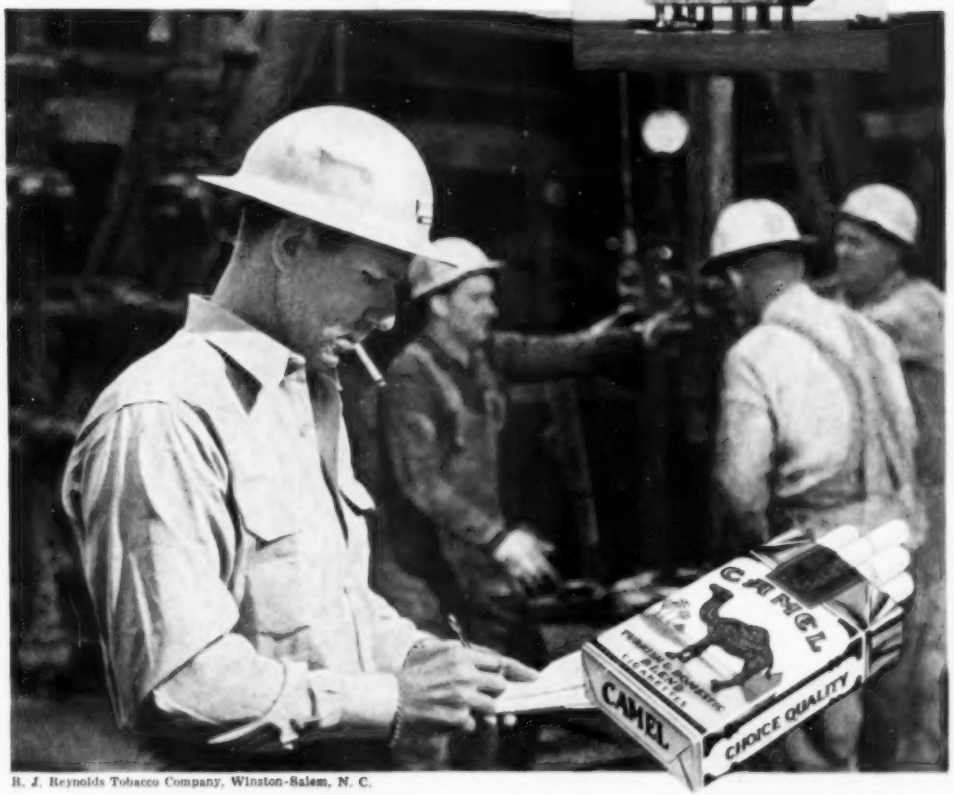
Postage Will be Paid by Addressee

Drilling for oil in the Gulf of Mexico.

The Offshore Company's Rig No. 54 sinks pipe 50 miles out at sea. Rig Supt. Hank Matthews is a Camel smoker. He says: "Camel's a *real* cigarette — lots of good flavor all the way."

Hank Matthews





R. J. Reynolds Tobacco Company, Winston-Salem, N. C.

HAVE A REAL CIGARETTE— HAVE A Camel

Discover the difference between "just smoking"... and Camels!

Taste the difference! Camel's good, rich flavor is deeply satisfying. No fads, no frills, no fancy stuff—simply the finest taste in smoking.

Feel the difference! The exclusive Camel blend of costly tobaccos has not been equalled for *smooth* smoking. Camels are easy to get along with.

Enjoy the difference! Try Camels. See for yourself why they're the largest-selling cigarette in America today. They've really got it!